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Health Care and Genesee County, New York: Economic Implications of Reduced Hospital Services

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Executive Summary

Changes in health care delivery and financing, along with shifting demographics, are reinventing health care institutions and market relationships. Many communities are struggling to provide health care services in ways that protect community economic interests and the health needs of local people. Local business interests, hospitals, and doctors in many communities are increasingly concerned about the capacity to provide quality products and services, while remaining competitive with providers in neighboring areas.

Tending to the well-being of local citizens is first priority, but the health sector is important to the economic vibrancy of local communities in three ways:

- Health service providers are a major source of employment;
- Dollars which the health sector brings into a community are multiplied through transactions and economic relationships with other sectors, thus contributing to the overall vitality of the local economy;
- The community health infrastructure is a potential source of economic growth because of its value as a determinate of life quality.

This study assesses the contribution health care providers make to the Genesee County economy. Other noneconomic contributions of this sector to local well-being are acknowledged here, but are not analyzed as part of the study.

- The assessment is motivated by recent structural changes in the delivery of health care services, including a recent hospital merger and continuing changes in the County health care environment.
- We assembled and examined information related to the role of health care services and the County economy, recovered data from local hospital records, integrated information into an economic model which can be used to depict economic relationships between the local hospital and the rest of the County economy.

- Geographical relationships do much to define the current situation. Despite a metropolitan designation, County residents often find it relatively more difficult to get access to a variety of health care products. Sometimes insurance premiums can be higher as well. On the supply side, local health care providers are often poorly leveraged in funding decisions for health services, resulting in low reimbursement rates, even though local providers are doing the same work. At the same time, changes in urban health systems impact local health care delivery, which can mean that in-county heath providers are no longer in a dominant position for making decisions about local health care choices.

In the midst of the debate over service choices and their costs, too little attention is given to the overall health care system and the non-medical importance of this health care system to the local community.

- The health care sector is a growth sector; nationally, health care expenditures increased from about $1,100 to over $2,700 per capita during the 1980s and to $4,760 by the year 2000. Projected increases are even more startling with more than a $4,000 per capita spending increase expected by the year 2010.
- Expenditures are dominated by outlays for hospital care and reimbursements for services provided by physicians and clinics. The third largest expenditure is for prescription drugs. Hospital costs in the US are expected to move from the range of $415 billion to $720 billion over the 2000-2010 interval. Expenditures for nursing home care are expected to approximately double over the next 10 years, and a 200 percent increase is projected this decade for in-home health care services.
- About 500,000 new jobs are expected in the hospital care services sector between the year 2000 and 2010, but more than twice that many jobs are projected for offices maintained by health practitioners. These practitioners are expected to add over 1.2 million new jobs this decade. Nursing homes and personal care facilities will contribute another 400,000 jobs compared with yet another 500,000 jobs added in residential care facilities.

Maintaining and perhaps even capturing a larger share of this spending and job growth can be significant for Genesee County.

- Considering national trends and judgments about local shares of health service expenditures, the data suggest that potential primary care expenditures per capita in Genesee County were in the vicinity of $3,140 in the year 2000, compared with the potential for an estimated $5,600 for the year 2010. On an aggregate basis, the data suggest that potential total in-county health expenditures might fall in the range of $350 million in the County by the year 2010.
- Employment in the Genesee County health care sector increased steadily during the early 1990s but fluctuated at a level somewhat less than 2,500 jobs later in the decade. These jobs account for about 10-11% of nonfarm wage and salary employment. Within the

health care sector, hospital employment dominates; but this dominance has been fading steadily locally just as it has elsewhere. Hospital employment in Genesee County comprised nearly two-thirds of total health care employment as the decade of the nineties opened compared to less than half by the end of the decade.

- Employment, output, and value added multipliers were estimated for the County health sectors for the most recent year for which complete data was available, 1998. Employment multipliers are the focus of this report. The employment multiplier of 1.43 calculated for local hospital services indicates that, if new consumer purchases of services are of sufficient magnitude to create 100 new hospital jobs, on average an additional 43 jobs would be created throughout the rest of the local economy. The hospital employment multiplier ranks second among the four health service sectors analyzed (doctors and dentists, nursing care, and other medical/health services). Adjustments to the hospital multiplier using 2000 data provided by UMMC yields a revised hospital sector multiplier of 1.45.
- An unlikely, but benchmark, worst case scenario is the complete elimination of all existing County hospital services. In addition to the loss of the 784 jobs associated with UMMC hospital employment directly, this scenario involves the elimination of 353 additional local jobs that are linked to local hospital operations. "Indirect" jobs would be lost in local businesses that provide supplies or inputs to the hospital itself, as well as jobs in other firms that supply these businesses. "Induced" jobs would be lost because local households in the hospital and hospital supply industries would reduce their spending in turn. The addition of the 353 indirect and direct jobs suggests that roughly 5% of the county workforce, as opposed to the 3% in hospital employment, would be at risk of losing jobs in the event of a hospital closure.
- If the hospital did not close, but instead reconstituted itself into a smaller, more specialized unit concentrating on certain basic services like emergency or outpatient clinics, only further study would identify the economic impacts of such a restructuring. An actual substantial downsizing would alter economic "input-output relationships" significantly as this would mean a new mix of staff, equipment, supplies, and so forth in smaller quantities and in different proportions.

This study provides the beginnings of a detailed evaluation of that sort. New detail would focus very directly on movement to a reduced care model for the community, and, perhaps, consideration of the specter of having no hospital care facilities available to citizens locally.

- Such analysis would measure service cost differentials encountered as the scope and depth of health care provision is reduced locally. A key cost issue is transportation if more and more local residents need to be transported elsewhere for care.
- Added transport costs would be accompanied by other, less transparent, new costs to the community. Hidden costs would begin to accrue around compromised or delayed decisions to seek care; frail or economically fragile populations will be the first to fall into this mode if the local hospital closes.

- Hospital closure would generate tertiary and negative impacts on local nursing home facilities and efforts to replenish or even maintain local access to county-based physicians and other medical care professionals. More physicians and medical care professionals will seek practice elsewhere and the fundamentals of the marketplace for nursing home services would change as well.
- Closing the County hospital or dramatically reducing the availability of local hospital services also has direct implications for emergency care and emergency preparedness. Closure triggers more transport to out-of-county emergency care facilities, some of which are presently overcommitted.

Health Care and Genesee County, New York: Economic Implications of Reduced Hospital Services[1]

Introduction

Changes in health care delivery and financing, along with shifting demographics, are reinventing health care institutions and market relationships in New York and throughout the United States. Many communities are struggling to provide health care services in ways that protect community economic interests and the health needs of local people. Local business interests, hospitals, and doctors in many communities are increasingly concerned about the capacity to provide quality products and services, while remaining competitive with providers in neighboring areas.

Dealing with these issues generates a number of information requirements. Tending to the well-being of local systems is first priority, but an important need is a better understanding of the economic contribution the local health care sector makes to the community. The community health care sector includes hospitals, physicians and other health care providers, pharmacies, nursing homes, and other related medical services. These service providers must configure their businesses in ways that serve customers' needs and, at the same time, recognize the economic fundamentals of the health service market.

The health care sector is important to the economic vibrancy of local communities in three ways. First, health service providers are a major source of employment. Second, dollars which the health care sector brings into a community are multiplied through transactions and economic relationships with other sectors, thus contributing to the overall vitality of the local economy. Third, the community health infrastructure is a potential source of economic growth because of its value as a determinate of life quality. Views on the quality of life affect the location decision of businesses and industries or retirees looking to relocate. Conversely, losing local access to quality health care fosters perceptions that life quality is diminished.

[1] This study was done with financial support provided by the Genesee County Industrial Development Agency.

To gain perspective on these issues in Genesee County, the Genesee County Industrial Development Agency, Cornell Cooperative Extension and Cornell University collaborated on an assessment of the contribution health care providers make to the County economy. The assessment is motivated by recent structural changes in the delivery of health care services. Economic circumstances have led to the merger of two long-lived hospital providers: St. Jerome, a Catholic hospital, and Genesee Memorial hospital, an independent hospital. The merger was a major step and a controversial step for the community and its economic ramifications for the merged hospital facility are still being understood and managed. In the meantime, continuing changes in the health environment are attenuating the local concern over hospital services.

To shed additional light on these issues, we assembled and examined information related to the role of health care services and the County economy. Then, we recovered extensive data from local hospital records. Information included reports for the merged United Memorial Medical Center, Genesee Memorial Hospital, and St. Jerome Hospital. We also carefully examined information related to the geographic distribution of current hospital expenditures. This examination included wages and salaries paid hospital staff, payments for professional medical services, and a variety of outlays for hospital operating expenditures. Then, we integrated that information into an economic model which can be used to depict economic relationships between the local hospital and the rest of the County economy. Model results allow one to explain the role health care plays in the generation of local income and employment, and it provides estimates of the economic impact associated with any reduced local provision of hospital services. The concluding section of the report summarizes the study and suggests directions for further analysis.

These model results are prefaced by sections that add perspective to the local hospital issue by summarizing national and statewide trends in the provision of health care services. We also quickly summarize benchmark data on local demographics and the structure of the Genesee County macro economy.

Health Care Changes — The Stakes for Local Communities

Changes occurring in the health care sector are having varying impacts for local communities. One variable is location, in particular proximity to larger urban centers. Genesee County, despite its largely rural character, is situated midway between Buffalo and Rochester and designated as part of the Rochester Standard Metropolitan Area (MSA); the Buffalo-Niagara Falls MSA is immediately to the west. The County is bisected by the New York State Thruway, providing high-speed highway access to adjacent urban cores. These geographical relationships do much to define the current situation for health care services. Despite the metropolitan designation, County residents, like rural residents elsewhere, often find it relatively more difficult to get access to a variety of health care products, compared with their more urban/suburban counterparts. Sometimes insurance premiums can be higher as well. On the supply side, local health care providers are often poorly leveraged in funding decisions for health services. This can result in lower reimbursement rates, compared with those enjoyed by providers in more urban locations; these differences persist even though local providers are doing the same work. At the same time, changes in urban health care systems impact local health care delivery, with the result that in-county heath care providers are no longer in a dominant position for making decisions about health care choices for local residents.

Necessarily, these trends and developments have focused immediate and needed attention on health status of the population and the steps that must be taken to deliver affordable effective health care. But sometimes, in the midst of this debate over service choices and their costs, too little attention is given to the overall health care system and the nonmedical importance of this system to the local community. Health care expenditures lead to job-making, which materially affects the economic base of the wider community. To ensure that health care services remain available locally, communities need to understand these nonmedical ramifications and the associated money flows.

The point of departure for looking at the economic dimensions of health care in the local community is, in fact, at the national level and shifts in Federal support for health services. The U.S. Congress passed recent legislation--the Balanced Budget Act of 1997 (BBA) and the

Balanced Budget Revised Act of 1999 (BBRA)—that contained several provisions that visit both positive and negative effects on local communities. This legislation gradually increases Medicare reimbursement levels in an effort to attract managed care plans to rural areas, attempts to pave the way for the formation of new managed care entities, and rolls out a health insurance program aimed at low-income children. On the other hand, this new congressional legislation also involves changed reimbursement policies which may ultimately harm hospital patients, nursing home residents, and citizens who depend upon home health providers.

The picture for health care access has shifted even more rapidly in recent months. The *New York Times* recently declared that Medicaid is in a "fiscal crisis" (1/14/02), with cutbacks to hospitals, nursing homes and pharmacies likely in many states. A November 2001 report released by the National Coalition on Health Care concluded more broadly that several economic forces, some fueled by the terrorist attacks of September 11, are at work to dramatically increase the number of uninsured people in the U.S in the coming months. It was estimated that as many as 6 million Americans will lose their health coverage in 2001 and 2002. A dominant force that has been building over the last three years is rapidly rising health insurance premiums, which will cause even more people to forgo health insurance coverage. The situation is exacerbated by accelerated unemployment powered by the economic downturn and the impact of the September 11 attacks. The Coalition estimates that unless the government takes substantial action approximately 45 million people will have no health insurance coverage by the end of 2002, up from a 2001 estimate of 39 million. Further, during the three-year period 2001-2003, an estimated 86 million Americans could suffer a gap in their health insurance coverage. The implications for hospitals are not good. Genesee County's United Memorial Medical Center, for example, estimates that it depended on Medicaid, Blue Cross, and Medicare for 64% of its net patient service revenues in 2000.

Anecdotal evidence and practical experience suggests that these broad, powerful developments play out differently for different communities. Downsides for smaller, more rural communities can be especially significant, with the local hospitals at the epicenter of health access and funding changes. When funding issues become acute for local hospital operations, they can and often do lead to mergers, outright purchases by urban or other outside interests, or restructuring

of services to some kind of limited care model. In due time, a closure of care facilities can be in the offing. Although hundreds of communities have witnessed hospital closures during the past quarter century, the problem has seemed particularly acute in rural areas during recent years. The higher probability of rural hospital closures has been shown to be associated with investor ownership, small size, and aging facilities as well as with a confluence of broader policy, economic, and demographic trends. The situation can be further attenuated if employers sign contracts with insurance plans that push patients to nearby urban centers for their health care, bypassing local, more convenient services. The situation can escalate and force changes in emergency medical services. Finally, local providers of long-term care can face fundamental shifts in their marketplace if hospital services are not available locally but shift to urban centers instead.

The nexus between health care services and local economic development plays directly into the decisions communities face in the health care arena in several ways. A strong health care system can help attract and retain the community's industry base and slow the out-migration of retirees. A strong health care system can create jobs in the local area. Studies usually show that quality-of-life factors are a significant factor in business and industry location decisions; adequate local health care services are a key element in the quality-of-life mix. Ready access to quality health care services locally can be instrumental in attracting and retaining high-quality labor and management resources for local businesses. Ready access can also yield important direct benefits in the form of enhanced labor productivity. Finally, the business community must necessarily manage their exposure to health insurance costs. The business community must be very attentive to shifts in health care access and costs and the steps they need to take to manage these factors. These considerations hold for businesses that are established in the community and looking for opportunities to maintain or expand current operations. In addition, sites that provide health care services at a low cost are sometimes given priority for new business location.

Looking beyond decisions made by business entities, a strong and convenient local health care system is obviously of central importance to retirees. Retired persons are a special group of residents whose spending can be a significant source of income for the local economy. Although the data for western New York are limited or nonexistent, several studies of retired persons

conducted elsewhere show the expected result. Namely, health service quality and quantity plays an influential role in the location decisions of retirees, along with such factors as personal safety, recreational facilities, taxes, and housing costs. While western New York is a somewhat unlikely magnet or hub for retirees, either now or in the future, retaining a larger proportion of the indigenous senior population can add some very significant social and economic benefits locally.

Follow the Money

The health sector is a growth sector of the US economy. Retaining or even expanding the local share of those outlays can materially affect local access to local jobs. Table 1 illustrates some of the broad relationships. In 1980, the national average amount spent annually on each person for health care was $1,085 in current dollars. This sum takes into account not only expenditures each year for personal care but also looks at public health services provided by government agencies at the federal, state, and local level. By 1990, national expenses for health care increased from $245 to more than $695 billion, pushing per capita expense to well over $2,700. Total health expenditures amounted to 12 percent of US gross domestic product (GDP) by 1990. Outlays nearly doubled during the 1990 decade to more than $1.3 trillion and increased the health share of GDP to 13 percent. Projected increases are even more startling with more than a $4,000 per capita spending increase expected by the year 2010 (Table 1). Nearly 13 million jobs are expected in the health care sector by the year 2010 according to the US Bureau of Labor Statistics.

Table 1. National Health Expenditures and Employment Data, US, Selected Years, 1980-2000 and 2010 Projections

Year	*Total Expenditures ($ Billions)*	*Per Capita Expenditures ($)*	*Expenditures as a Percent of GDP (%)*	*Employment in Health Sector (000 Jobs)*
1980	245.8	1085	9	n/a
1990	695.6	2,736	12	7,814
2000	1311.1	4,762	13	10,095
2010	2637.4	8,795	n/a	12,934

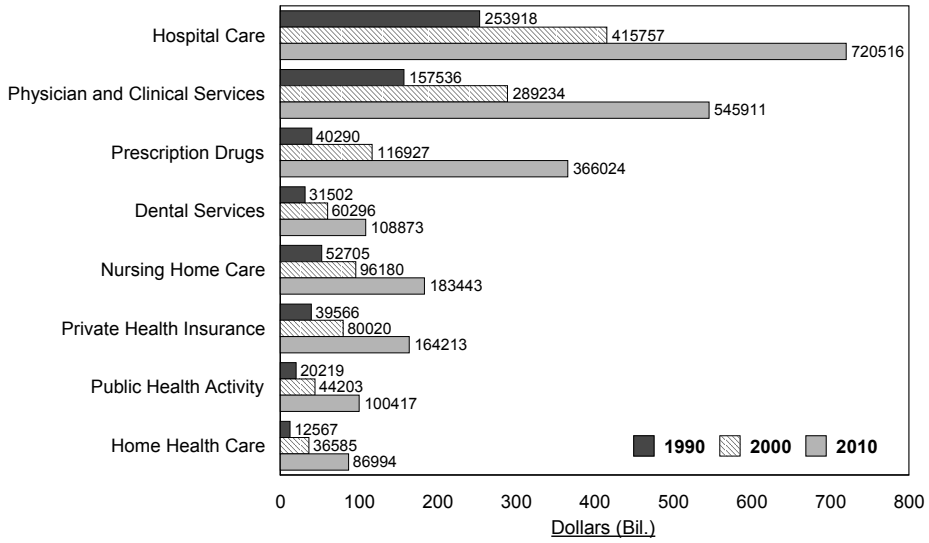
n/a: Not available.
Source: US Dept of Health and Human Services, Health Care Financing.

Disaggregating these expenditure and employment estimates by type of service, as shown in Figures 1 and 2, can be revealing. Expenditures are dominated by outlays for hospital care and reimbursements for services provided by physicians and clinics. The third largest expenditure in the year 2000 was for prescription drugs. While prescription drug expenditures are expected to lag behind those for hospitals, physicians and clinics early this decade, they will still increase by orders of magnitude. By the year 2010, prescription drug expense should approach $370 billion (Figure 1). Expenditures for physicians and clinics are projected to increase to $545 billion, up from about $290 billion in 1990. As noted earlier, hospitals will account for a very significant proportion of all expenditure increases this decade. Hospital costs are expected to move from the range of $415 billion to $720 billion over the 2000-2010 interval.

Although smaller in relative terms, some substantial increases in outlays are also expected for other classes of health care expenditures. Some of these expenditures are also critical in the economic life of many local communities. A key example is nursing home care, where projected spending is likely to approximately double over the next ten years to $183 billion. At the same time, a well over 200 percent increase is projected for in-home health care services over the ten-year span. By the year 2010, federal statistics suggest that expenditures for care in the patient's home will exceed $85 billion annually. Although the Nation has a growing army of uninsured persons, dramatic increases in health care insurance costs are also projected, with outlays more than doubling between the years 2000 and 2010.

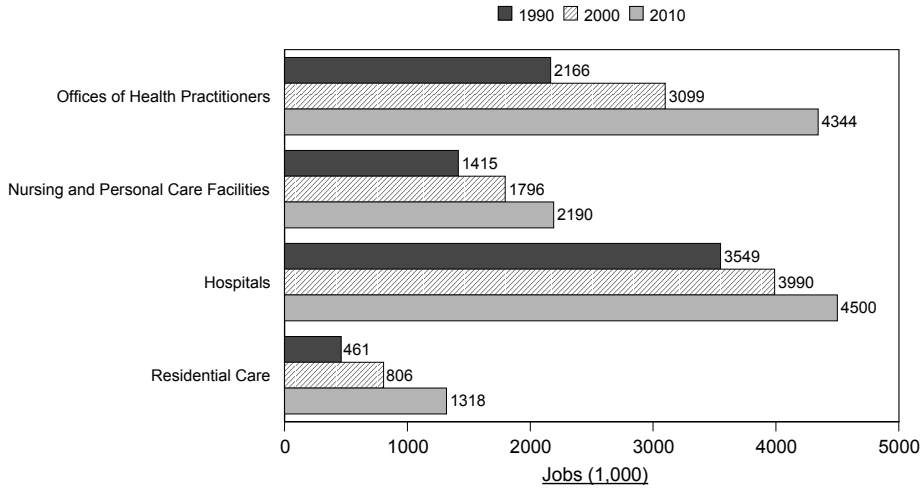
Additional spending beyond the rate of inflation implies new job-making, especially in the labor-intensive health services sector. In absolute terms, although there are very substantial increases in spending for hospital services in the offing, increased employment prospects in hospitals will not dominate the near-term health services job picture. About 500,000 new jobs are expected in the hospital care services sector between the year 2000 and 2010, but more than twice that many jobs are projected for offices maintained by health practitioners. These practitioners are expected to add over 1.2 million new jobs this decade. Nursing homes and personal care facilities will contribute another 400,000 jobs compared with yet another 500,000 thousand jobs added in residential care facilities (Figure 2).

Figure 1. Total expenditures for selected health services, US, 1990, 2000 and 2010 projections



Source: US Dept. of Health and Human Services, National Health Expenditure (NHE) at *http://www.hcfa.gov/stats/NHE-Proj/.*

Figure 2. Employment in selected health service sectors, US, 1990-2000 and 2010 projections



US Department of Labor, Bureau of Labor Statistics (BLS) at ftp*://ftp.bls.gov/pub/special.requests/ep/ind.employment/empinddetail.txt*

Table 2. Estimated Potential Primary Health Care Expenditures for Genesee County

Health Service	*U.S. Per Capita*		*Percent Primary (Local) Care*	*Primary Care Expenditures Per Capita*		*Genesee County Potential Expenditures*	
	2000	*2010*		*2000*	*2010*	*2000*	*2010*
Hospital Care	$1,510	$2,403	60%	$906	$1,442	$54.7	$87.2
Physician/Clinical Services	1051	1821	75%	$788	$1,366	$47.6	$82.6
Dental Services	219	363	75%	$164	$272	$9.9	$16.5
Other Prof. Care	150	298	75%	$113	$224	$6.8	$13.5
Home Health Care	349	290	100%	349	290	$21.1	$17.5
Nursing Home Care	324	612	100%	324	612	$19.6	$37.0
Prescription Drugs	425	1221	75%	$319	$916	$19.2	$55.4
Net Cost of Health Insurance	291	548	0%				
Government Public Health Activities	161	335	50%	$81	$168	$4.9	$10.1
Health Research	88	153	0%				
All Other Expenditures	$194	$751	50%	$97	$376	$5.9	$22.7
Total Health Expenditures	$4,762	$8,795	65%	$3,140	$5,664	$189.6	$342.7

Source: Derived from data provided by the Health Care Financing Authority (HCFA); US Census Bureau; Eilrich, St.Clair, and Doeksen.

Maintaining and perhaps even capturing a larger share of this spending and job growth can be significant for a community. A crude but useful local perspective on the national numbers is shown in Table 2, suggesting what outlays for health services at the per capita national average might mean for Genesee County and for locally provided primary care. Of course, per capita expenditures in Genesee County could diverge from the national average for several reasons but will unmistakably move in a similar direction. Following the values presented in Table 1, total health care expenditures are expected to approach $8,800 per person by the year 2010. Following Federal statistics that provide estimates of expenditures for major classes of services, judgments about the fraction of each service class that can be delivered locally can be used to give a general indication of the potential local share of health expenditures by major expenditure category. The percentages attributed to local primary care range from 0 to 100 percent, depending on type of service (Table 2), suggesting that potential primary care expenditures per

capita in Genesee County were in the vicinity of $3,140 in the year 2000, compared with an estimate exceeding $5,600 for the year 2010. On an aggregate basis, the data suggest that potential expenditures might fall in the range of $350 million in the County by the year 2010.

These crude estimates could be refined, but regardless, they still reinforce the notion that much is to be gained by doing what can be done to make provisions for dealing with local health care locally. Actual expenditure outcomes await further study, but further scrutiny is not needed to conclude that erosion of local health care services, from any source, will move these health expenditure dollars and health care employment options away from the County and into the income stream and employment rosters of communities elsewhere. Similarly, reimbursements from governments or private insurance carriers that discriminate against smaller communities will also have a deleterious impact on expected surges in health care spending over the next decade.

Table 2 also sets the stage for gauging the stakes for a hospital closure or dramatic reductions in local hospital services. Initial effects would erode expenditures for hospital care which amount to about one-quarter of all health expenditures, according to national trend. But collateral effects would include a diminished base for locally provided physician services and reduced local access to skilled nursing and home health care services. These categories of services account for about 40 percent of total health care expenditures. At the same time, cash flows for prescription drugs (16 percent of total health care expenditures at the national level by 2010) might also be diminished in-county, causing additional unfavorable economic impacts.

The Genesee County Situation

Selected demographic features of the County are briefly highlighted in this section. The just-released 2000 decennial population census highlights are presented in Table 3. The numbers suggest that, on balance, Genesee County looks much like the rest of New York State and the Nation from a demographic perspective.

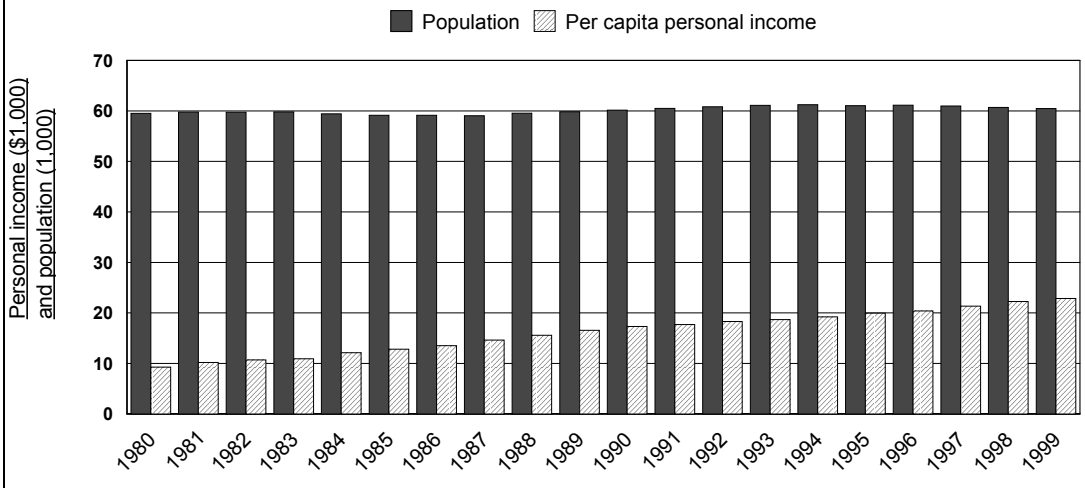
Table 3. Selected Demographic Data for Genesee County with US and New York Comparisons, 2000

Subject	*Genesee County*		*New York*	*US*
	Number	*Percent*	*Percent*	*Percent*
Total population	60,370	100.0	100.0	100.0
Male	29,717	49.2	48.2	49.1
Female	30,653	50.8	51.8	50.9
Under 5 years	3,654	6.1	6.5	6.8
5 to 9 years	4,441	7.4	7.1	7.3
10 to 14 years	4,775	7.9	7	7.3
15 to 19 years	4,447	7.4	6.8	7.2
20 to 24 years	2,932	4.9	6.6	6.7
25 to 34 years	7,544	12.5	14.5	14.2
35 to 44 years	10,292	17	16.2	16
45 to 54 years	8,111	13.4	13.5	13.4
55 to 59 years	3,079	5.1	4.9	4.8
60 to 64 years	2,434	4.0	4.0	3.8
65 to 74 years	4,282	7.1	6.7	6.5
75 to 84 years	3,278	5.4	4.5	4.4
85 years and over	1,101	1.8	1.6	1.5
Median age (years)	37.4	(X)	(X)	(X)
18 years and over	44,640	73.9	75.3	74.3
Male	21,753	36	35.5	35.9
Female	22,887	37.9	39.7	38.4
21 years and over	42,435	70.3	71.2	70.0
62 years and over	10,107	16.7	15.2	14.7
65 years and over	8,661	14.3	12.9	12.4
HOUSEHOLDS BY TYPE				
Total households	22,770	100.0	100.0	100.0
Family households (families)	15,823	69.5	65.7	68.1
With own children under 18 years	7,572	33.3	31.6	32.8
Married-couple family	12,611	55.4	46.6	51.7
With own children under 18 years	5,682	25	21.6	23.5
Female householder, no husband present	2,241	9.8	14.7	12.2
With own children under 18 years	1,361	6.0	8.1	7.2
Nonfamily households	6,947	30.5	34.3	31.9
Householder living alone	5,637	24.8	28.1	25.8
Householder 65 years and over	2,535	11.1	10.1	9.2
Households with individuals under 18 years	8,142	35.8	35.0	36.0
Households with individuals 65 years and over	5,964	26.2	25.0	23.4

Source: U.S. Census Bureau.

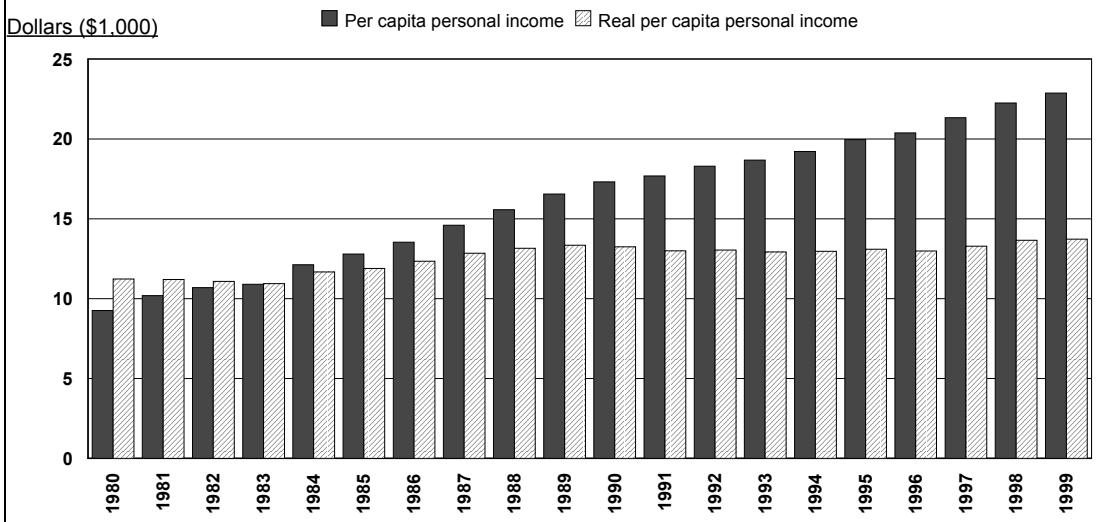
Long-run trends are a different matter. While the U.S. population and volume of personal income is growing, the county tracks the rest of upstate New York. Both population and personal income growth are relatively stagnant. Glancing back to the 1980s indicates a good deal of population and income stability in the County (Figure 3). Total population has been stable over those years, hovering in the 60,000 range. Personal income, an aggregate measure of economic well-being, has increased slowly but steadily over the last two decades, bringing per capita income to nearly $23,000 in 1999. After making adjustments for the general price level, however, it can be seen that personal income plateaued in the mid-1980s and has remained relatively constant since that time (Figure 4).

Figure 3. Population and per capita personal income for Genesee County, 1980-1999



Source: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

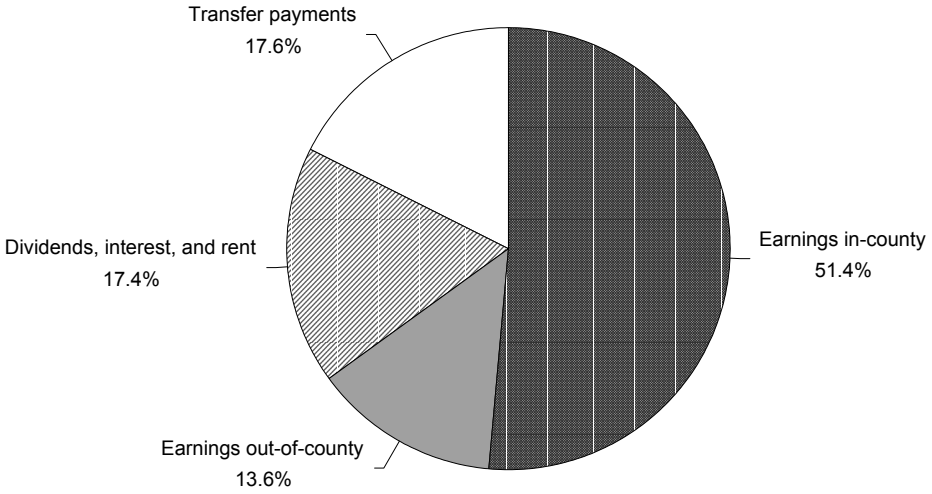
Figure 4. Per capita personal income for Genesee County, current and real (1982-1980-1999



Source: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

According to Federal statistics, slightly more than 50 percent of total personal income is attributable to earnings generated within the County. The category *personal income*, referred to as *earnings*, includes the net income earned by proprietors of businesses, along with wage and salary payments. In addition, some residents commute to jobs outside of the County. Wages and salaries gathered from this source account for about 13 percent of total personal income. Remaining personal income comes from passive income sources. These unearned incomes include transfer payments and income received in the form of dividends, interest, or rents. More than a third of total personal income in Genesee County comes from passive income sources (Figure 5).

Figure 5. Sources of personal income, Genesee County, New York, 1999



Source: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System (REIS).

In contrast to demographic statistics, the County diverges materially from New York State and the Nation in terms of its economic structure. While transfer payments and other unearned income sources are significant elsewhere, a relatively larger proportion of earnings generated in Genesee County come from agricultural sources; however, earnings in agriculture account for less than 5 percent of total earnings (Table 4). Another material difference relates to earnings generated in manufacturing, where the county share of earnings from manufacturing is double the state average. On the other hand, dependence on earnings generated by service employment is relatively low in-county—pegged at 21 percent, compared with 31 and 29 percent in New York State and the Nation, respectively. One-quarter of all earnings in Genesee County are attributable to government enterprises, a fraction materially higher than the amount observed in New York State or the Nation.

Table 4: Total Personal Earnings for Genesee County, with New York and National Comparisons, 1999

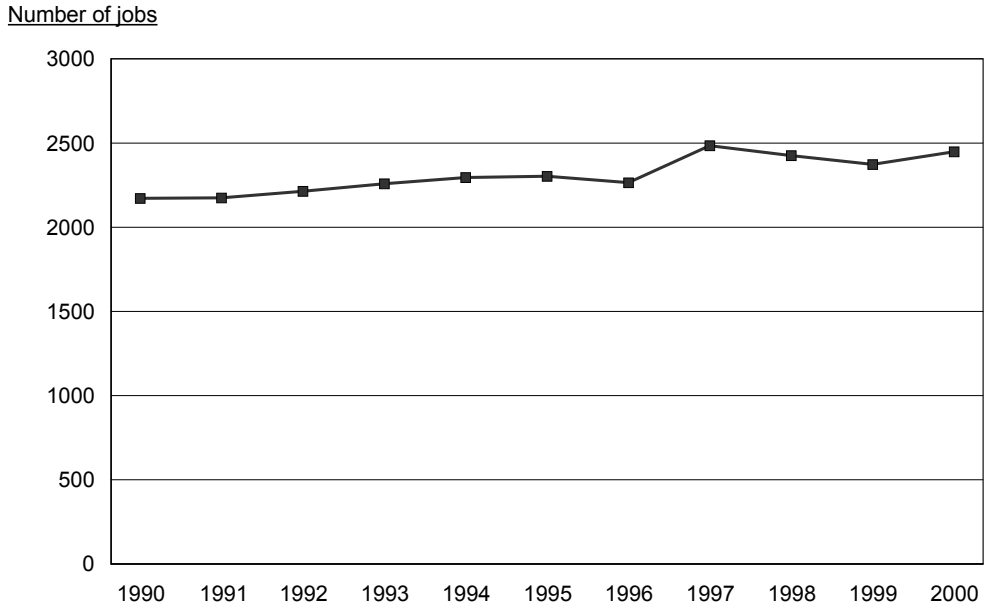
Industrial sector	*Genesee County*		*New York*	*US*
	Dollars (1,000)	*Percent*	*Percent*	*Percent*
Total	$752,266	100.0	100.0	100.0
Farm earnings	25,222	3.4	0.1	0.8
Ag. services, forestry, fishing	4,669	0.6	0.5	0.7
Mining	3,921	0.5	0.1	0.8
Construction	39,138	5.2	3.7	5.8
Manufacturing	153,756	20.4	10.9	16.1
Durable goods	97,479	13.0	5.6	10.1
Nondurable goods	56,277	7.5	5.3	6.0
Transportation and public utilities	40,711	5.4	5.6	6.7
Wholesale trade	47,226	6.3	5.5	6.2
Retail trade	72,756	9.7	6.6	8.9
Finance, insurance, and real estate	18,472	2.5	21.6	9.1
Services	157,115	20.9	31.3	28.9
Hotels and other lodging places	4,417	0.6	0.7	0.9
Personal services	11,781	1.6	0.7	0.8
Private households	1,066	0.1	0.3	0.2
Business services	20,091	2.7	6.8	7.1
Auto repair, services, and parking	6,584	0.9	0.5	0.8
Miscellaneous repair services	2,850	0.4	0.2	0.3
Amusement and recreation services	16,956	2.3	1.3	1.0
Health services	49,700	6.6	0.9	7.8
Legal services	5,464	0.7	8.0	2.0
Educational services	5,089	0.7	3.7	1.2
Social services	11,328	1.5	1.9	1.0
Membership organizations	7,929	1.1	1.6	0.9
All other services	13,860	1.8	4.9	4.8
Government and government enterprises	$189,280	25.2	14.3	15.8

Source: US Dept. Commerce, Regional Economics Information System

The structure of the economy can also be looked at through the important lens of employment. As is typical for many rural economies, and as suggested by the spending/personal income assessment discussed above, the health care sector makes an important direct contribution to employment in Genesee County; the same is true for the broader Genesee, Livingston, Orleans, and Wyoming County (GLOW) region. According to unpublished, annual figures maintained by the New York State Department of Labor, employment in the Genesee County health care sector

increased steadily during the early 1990s. By the late 1990s the trend was less steady, with a total that was fluctuating at a level somewhat less than 2,500 jobs (Figure 6). Total nonfarm wage and salary employment grew slowly but, for the most part, steadily through the 1990s (Figure 7). By the late 1990s, health care sector jobs accounted for about 10-11% of employment in the County.

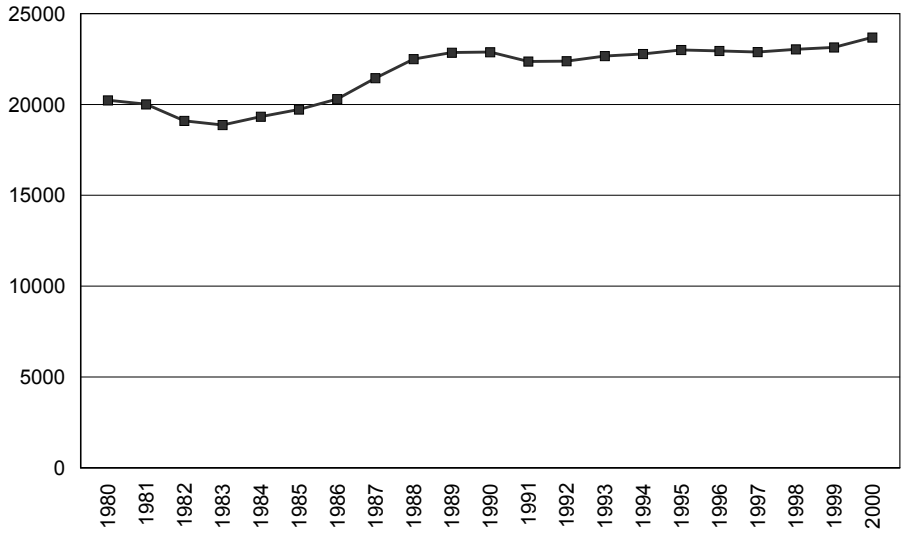
Figure 6. Estimated full and part-time employment, health services (SIC 80), Genesee County, New York, 1990-2000



Source: Unpublished data from the NYS Dept. of Labor.

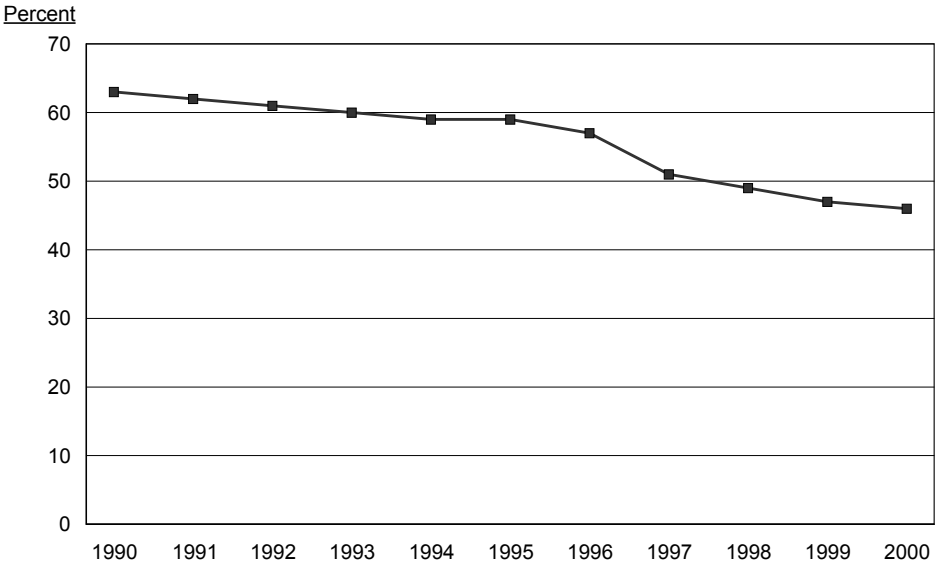
Within the health care sector, hospital employment dominates. The local hospital share is well over twice the share observed nationally. However, despite the high level, this dominance has been fading steadily locally just as it has elsewhere. Whereas hospital employment in Genesee County comprised nearly two-thirds of total health care employment as the decade of the nineties opened, its share of the total had declined to less than half by the end of the decade (Figure 8). The decline is continuous over this period but accelerated after 1996.

Figure 7. Total nonfarm wage and salary employment in Genesee County, 1980-2000



Source: NYS DOL (ES-202) at: *http://www.labor.state.ny.us/labor_market/lmi_business/insured/search.htm.*

Figure 8. Hospital employment (SIC 8062) as a proportion of Genesee County health care employment (SIC 80)



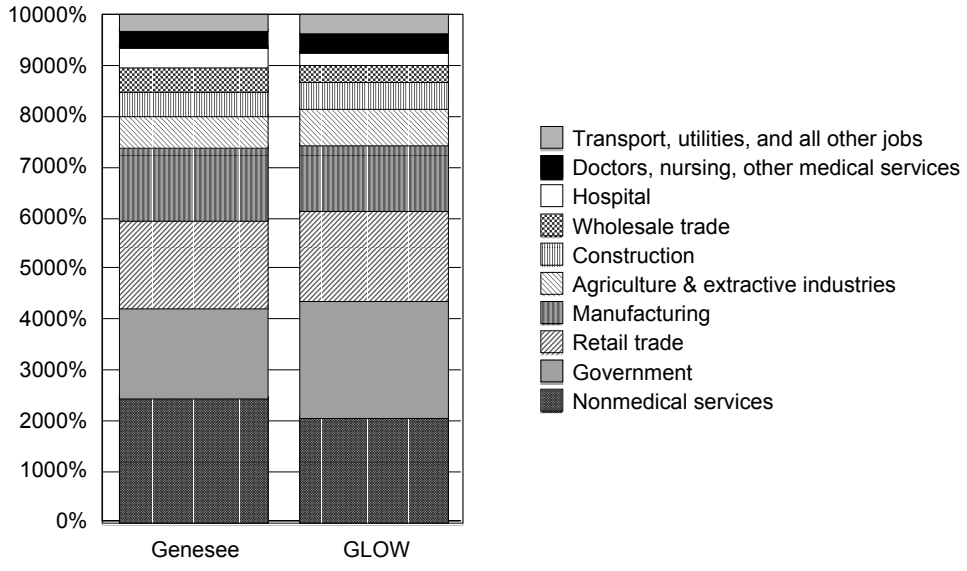
Source: Unpublished data from the NYS Dept. of Labor.

The health care sector employment data just described tracks employment at somewhat higher levels (16% higher in 1998) than the adjusted data incorporated into the regional economic modeling system (IMPLAN, as provided by MIG, Inc.) that formed the basis of our impact analysis. This discrepancy is likely due to the adjustments that MIG, Inc. must make to county-level data to ensure it can be integrated into a comprehensive, multi-sector economic model that is consistent with state and national data totals.[2]

The IMPLAN data depicts the hospital and other health care sectors as accounting for about 6% of total 1998 employment. Figure 9 shows that hospital employment is slightly more significant within the overall health care industry in Genesee County than it is within the GLOW region as a whole. Similarly, the remaining service sector industries account for a higher proportion of employment in Genesee County than they do in the four GLOW counties together.

[2] Data provided directly by UMMC in 2001 claims 784 hospital employees, a figure which is notably lower than the 1998 IMPLAN data reflecting hospital sector employment in the County. This may, in part, reflect real changes in sectoral employment. Several of IMPLAN's data sources lag several years and would reflect the status quo prior to the hospital merger. Unfortunately, discrepancies in data on employment from different sources are not uncommon, especially for small area labor markets. One important reason is differences in job definitions. Definitions embedded in public data sources and, hence, IMPLAN data used in this report largely turn on employment reports submitted by employers subject to the NYS Unemployment Insurance Law. This reporting covers most employees on nonfarm payrolls across the State. Reporting is done on a quarterly basis, which can provide variation due to part-time or seasonal employment.

Figure 9. Employment shares by sector in Genesee County and the GLOW region, 1998



Source: Unpublished data from the NYS Dept. of Labor.

One major advantage of an economic input-output model like IMPLAN is its ability to quantify linkages between different economic sectors. Multipliers are key summary indicators of this linkage. There are numerous kinds of multipliers that can be calculated. They vary mostly in the economic metric or variable of interest (e.g. employment, output, value added) and in the assumptions about how income to labor, business owners, and government is spent within the local economy. However, each multiplier is fundamentally a measure of the extent to which additional purchases of product in a given economic sector stimulate new economic activity throughout the entire economy.

The multipliers shown in Table 5 are Type II employment multipliers for health care in Genesee County and the four-county GLOW region. IMPLAN Type II multipliers account for the way households with different income levels spend additional income that is generated by increased purchases of locally produced goods and services. The employment multiplier of 1.57 for doctors and dentists, for example, indicates that if a new consumer purchase of services from doctors or

dentists were of sufficient magnitude to create 100 new jobs in that economic sector, on average an additional 57 jobs would be created throughout the rest of the local economy.

Table 5. Estimated Employment Multipliers for Selected Health Service Sectors, Genesee County and GLOW Region, 1998

	Type II Multiplier	
Health sector	*Genesee*	*GLOW*
Doctors and Dentists	1.57	1.57
Nursing and Protective Care	1.27	1.26
Hospitals	1.43	1.42
Other Medical and Health Services	1.32	1.27

Source: MIG, Inc IMPLAN.

The more that a local industry is able to produce goods and services using inputs from other local businesses, and the more that the industry's wage earners buy local goods and services, the greater the multiplier. The multipliers reported in Table 5 show that purchases of medical services from doctors' and dentists' offices provide a stronger stimulus to job creation in other parts of the local economy in comparison with other health care sectors. The hospital multiplier ranks second among the four listed sectors. There are only minor differences in the multipliers for Genesee County alone and for the GLOW region. Insofar as the Genesee multipliers are marginally greater than those for the GLOW region, one might conclude that the Genesee County health care sectors are slightly better integrated with local businesses than is true in the other three counties.

It is useful to compare these multipliers with those for other local industries in order to place them in context. The multiplier value averaged across the 165 IMPLAN industry sectors present in Genesee County is 1.75. The multiplier value averaged across the 214 IMPLAN industry sectors present in the GLOW region is 1.78. Each of these averages is greater than that for any of the individual health sector multipliers. Given the relatively sophisticated and specialized nature of the health care sector, it should not be all that surprising that there are many other local businesses that have stronger linkages back to local suppliers of inputs.

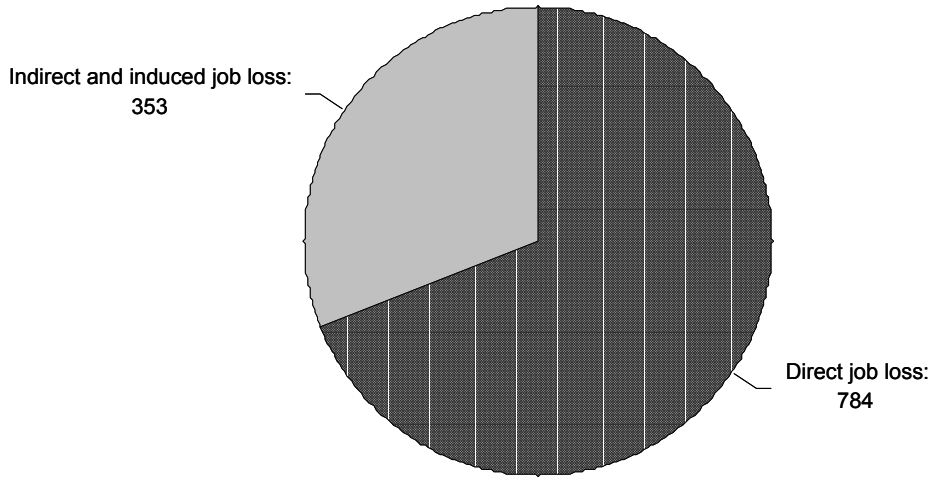
While interpreting the calculated multipliers is of some interest, input-output models like IMPLAN are more fruitfully used to conduct economic impact analyses. Given any estimated or assumed change in the level of demand for the goods or services produced by one industry, the repercussions on the rest of the economy can be estimated in terms of changes in output, employment, taxes, wages, and similar economic variables. In the current instance, we have used IMPLAN to estimate the employment impacts of a cutback or outright elimination of services in the hospital sector.

The first "naïve" scenario we consider is the complete elimination of all existing hospital services. We consider this scenario to be naïve in several respects. First, we have no indication that this scenario is highly likely; hospitals and all expenditures associated with them would not easily disappear entirely. In general, studies of stressed rural hospitals suggest that conversion to alternative health care uses is not an unusual outcome for troubled rural hospitals. Conversions can involve both new, or more limited or specialized, health care service. Reuse of the hospital facility for nonmedical purposes is also possible. Together, these possibilities may be as likely as, or more likely than, the total disappearance of the hospital. The economic as well as the health care implications of each kind of change can vary significantly. The scenario is also naïve because even if the hospital facility itself vanishes in terms of economic significance, it is likely that at least some of the services it provided would be compensated by the increased economic activity of other local medical providers. Finally, all input-output models assume linear relationships based on production performance averages within an industry sector. Structural changes in the industry more likely would involve more complicated "nonlinear" relationships not necessarily reflecting historically average production relationships or technologies. For all these reasons, the scenario is indeed simply that -- a scenario. It is less useful as a prediction of what might actually happen than as a measure of the existing dependencies of local jobs on the fully functioning hospital.

Figure 10 shows the IMPLAN estimated employment impacts of the complete elimination of the hospital sector in Genesee County. Some of the default IMPLAN data has been adjusted using locally available data. Data was provided by UMMC on employment, wages, revenues, and expenses. Most importantly, the hospital provided information on the wages of employees who

lived within Genesee County. We assume these individuals are more likely to purchase goods and services within the County than are employees who live elsewhere. According to UMMC data, approximately $24.5 million was spent on employee salaries and benefits in 2000, with $20.4 million of this in salaries. Additional information indicates that 80% of these wages are earned by employees who live in Genesee County.

Figure 10. Employment impacts (job loss) assuming total elimination of hospital services in 1998
(Direct, indirect, induced impacts - 1,137 total jobs lost)



Similarly, the hospital provided information on its purchases of goods and services by identifying the amounts spent on local vendors. UMMC data indicates that a total of $12.7 million were spent on "medical and professional fees, supplies, and purchased services" in 2000. Of these purchases, approximately 25.1% ($3.2 million) were from firms located in Genesee County.[3]

The IMPLAN analysis summarized in Figure 10 is based on conservative assumptions or estimates including those just suggested, namely that (a) only an insignificant portion of the

[3] An additional 0.15% were from firms in the other three GLOW counties; an additional 2.3% of purchases were from Rochester area firms.

hospital income earned by nonresidents of Genesee County is spent within the county; (b) only 25.1% of the hospital's purchases are from firms located in Genesee County; (c) we have accurately assigned each hospital supplier or vendor to the correct IMPLAN industry sector,[4] (d) the 784 hospital employees identified by UMMC in 2000 are a comprehensive list of workers, and (e) no profits or returns to owners of the hospital are spent locally.

The results in Figure 10 show 1,137 total jobs at risk. This number constitutes nearly 5% of jobs in the County. In addition to the loss of the 784 jobs associated with hospital employment directly, "indirect" jobs would be lost in local businesses that provide supplies or inputs to the hospital itself, as well as jobs in other firms that supply these businesses in turn. The further "induced" jobs that would be lost are linked to the decline in local spending of income that would have been earned by hospital employees or the employees of all other businesses that benefit economically from spending by the hospital or its employees. The addition of the 353 indirect and induced jobs is what pushes the total to something more like 5% of the county workforce, as opposed to the 3% directly in hospital employment, that would be at risk of losing jobs in the event of a hospital closure.[5]

What if the hospital did not close, but instead reconstituted itself into a smaller, more specialized unit concentrating on certain basic services like emergency or outpatient clinics? It would be possible to analyze the broader economic impacts of such a restructuring using IMPLAN. A simple way of partially modifying the naïve assumption would be to assume "same product mix, but less of it". Because IMPLAN is a fully linear model, the impacts all change in the same degree. In other words, the job losses would be only three-quarters as large, implying that about 3.5% (853 jobs) as opposed to 5% (1,137) of the County's employment base might be at risk.

However, in the event of an actual substantial downsizing it is likely that the economic "input-output relationships" would change significantly. A downsized hospital would be unlikely to require the exact same mix of doctors, nurses, equipment, supplies, and so forth in smaller

[4] There are 167 IMPLAN industry sectors present in Genesee County, and 216 in the GLOW region.
[5] Because the analogous results in absolute (as opposed to percentage) terms for the GLOW region as a whole differ only slightly, they are not reported here.

quantities but similar proportions. In this case, the impact analysis would have to be based on a detailed understanding of how the restructuring would change the hospital's purchasing patterns. It is beyond the scope of the current project to gain such a detailed understanding.

Summary and Implications

- Less than a decade ago, there were two hospitals in Genesee County. These institutions helped define and shape community life and community well-being. A converging set of circumstances required re-evaluation of these arrangements and led to a merger.
- Concern over the consolidation of hospital services is still in play because the details are just now being worked out. Furthermore, the concern over hospital care will continue. There are anecdotal reports of continuing out-migration of county residents to hospitals in Buffalo, Rochester, and Medina, along with the Wyoming Community Hospital.
- Along with competitive services in other communities, several other outside forces are also affecting hospital care issues in Genesee County. These include important changes in federal reimbursement for medical care services and new arrangements for state funding. For the former, the federal government is putting pressure on hospitals as it looks for ways to restrict the revenue stream from the federal treasury. The issue at the state level is largely related to Medicaid and again, we see higher levels of government looking for ways to squeeze "efficiencies" out of the health-care system and promote the use of managed care. These are among the factors that can mitigate against successful, sustainable financial arrangements for the county hospital.
- Several collateral issues follow from adjustments and hospital services. The key one is the interplay between local hospital services and skilled nursing services. Nursing homes often receive patients upon referral in the aftermath of a discharge from a hospital facility. If local hospital services are seriously eroded, then local nursing home operators face a different and undoubtedly less vibrant marketplace. Other collateral issues follow for elderly care, not the least of which is homecare for elderly persons, along with wellness programs and arrangements for patient transport and allied services.
- This study provides the beginnings of a detailed evaluation of the communitywide aspects associated with hospital and health care services in the County. Further

comparisons of the current situation, a movement to a reduced care model for the community, and, perhaps, consideration of the specter of having no hospital care facilities available to citizens locally are the next steps. What impact will these changes have on quality of life for the community? What are the collateral impacts on the intellectual capacity of the community as doctors, professionals and other elites leave the County because hospital access is no longer present?

- The analysis thus far allows us to elaborate upon the likely impacts of marginal increases and decreases in the availability of hospital services in the County.
    - Employment in the Genesee County health care sector increased steadily during the early 1990s but fluctuated at a level somewhat less than 2,500 jobs later in the decade. These jobs account for about 10-11% of total employment. Within the health care sector, hospital employment dominates; but this dominance has been fading steadily locally just as it has elsewhere. Hospital employment in Genesee County comprised nearly two-thirds of total health care employment as the decade of the nineties opened, compared with less than half by the end of the decade.
    - Employment, output, and value added multipliers were estimated for the County health sectors. The employment multiplier of 1.43 to 1.45 calculated for local hospital services indicates that if new consumer purchases of services are of sufficient magnitude to create 100 new hospital jobs, on average an additional 43 jobs would be created throughout the rest of the local economy. The hospital employment multiplier ranks second among the four sectors analyzed (doctors and dentists, nursing care, and other medical/health services).
    - An unlikely, but benchmark, worst case scenario is the complete elimination of all existing County hospital services. In addition to the loss of the 784 jobs associated with hospital employment directly, another 353 jobs would be lost throughout the entire local economy. The additional of the 353 jobs suggest that 5% of the county workforce, as opposed to the 3.5% in hospital employment, would be at risk of losing jobs in the event of a hospital closure.
    - If the hospital did not close, but instead reconstituted itself into a smaller, more specialized unit concentrating on certain basic services like emergency or outpatient clinics, further study would allow analysis of the economic impacts of such a restructuring using IMPLAN. An actual substantial downsizing will alter economic

"input-output relationships" significantly because of a new mix of staff, equipment, supplies, and so forth.

- A second level of impact analysis also falls beyond the scope of this study. Such analysis would deal with measurement of service cost differentials encountered by local agencies and individual citizens as the scope and depth of health care provision is reduced locally. Not the least of these costs considerations relate to transport. If local hospital services are reduced, more and more local residents will need to be transported elsewhere for care. A substantial amount of these added costs will fall on county government when arrangements were made to achieve health care access for citizens receiving county assistance, including Medicaid benefits. Discussions locally indicate that there is probably not, at present, a workable transportation system for the hospital closure scenario. The transport system would have to be completely redesigned, both for county clients and for other local citizens, in the aftermath of a hospital closure or a drastic reduction in availability of local hospital services.
- Added transport costs would be accompanied by other, less transparent, new costs to the community. A particular concern is the hidden costs that would begin to accrue around compromised decisions to seek care and/or delayed decisions to seek care. Frail or economically fragile populations will fall into this mode if the local hospital closes. These added costs are cumulative over time and, once again, will exert a corrosive effect on overall health care costs and quality of life in the community.
- Another secondary but critical concern associated with a hospital closure would be tertiary impacts on local nursing home facilities and efforts to replenish or even maintain local access to county based physicians and other medical care professionals. If the hospital closes, more physicians and medical care professionals will seek practice elsewhere; this will compound current difficulties associated with arranging for inadequate supply of locally based primary care givers. Local nursing homes will also feel the pinch associated with a hospital closure. Transport is an issue for local nursing home operators, and local providers of nursing home services would probably need to think about augmenting their current transport capability in the aftermath of a hospital closure. Beyond this, the fundamentals of the marketplace for nursing home services would change as well. Some residents move to nursing homes because of dementia and

related problems associated with old age. The marketing access to these populations would probably remain reasonably stable in the aftermath of a hospital closure. But the nursing home would be clearly disadvantaged and in danger of losing the customer base that relates to acquisition of primary, hospital medical care and subsequent referral to nursing home for rehabilitation. Local nursing homes could easily fall out of the loop in important ways without local hospital services.

- Emergency room services throughout Western New York, not unlike the rest of New York State and the Nation, are presently under a great deal of stress. Closing the County hospital or dramatically reducing the availability of local hospital services has direct implications for emergency care. The worst-case scenario would be the attenuated circumstances associated with a hospital closure. Then, patients needing emergency care would need to be transported in ever-greater numbers to hospitals outside the county, and often to facilities that are already overcommitted.
- Another important line of discussion deals with collaborations and alliances, such as those represented by the Lake Plains Healthcare Network. Regardless of the exact correction of health care needs in-county, it seems clear that cooperation on health care planning and health care access on a regional basis are advantageous to all parties. Prospects for the Network are one of several elements that need to be incorporated into a broad-based community action plan for health care. Other planning elements relate to bio security and elevated concerns about emergency planning.

Bibliography

Alexander, J.A., and M.J. Succi. "Correlates of State Legislation and Policy Enabling Rural Hospital Conversion and Closure." *The Journal of Rural Health*, Vol. 12, No. 5, 1996.

Basu, J. and J. Cooper. "Out-of-Area Travel from Rural and Urban Counties: A Study of Ambulatory Care Sensitive Hospitalizations for New York State Residents." *The Journal of Rural Health*, Vol. 16, No. 2, Spring 2000.

Blanchfield, B.B. S.J. Franco and P.E. Mohr. "Critical Access Hospitals: How Many Rural Hospitals Will Meet the Requirements." *The Journal of Rural Health*, Volume 15, Number 2, Spring 2000.

Cordes, S., J. Hoffman, E. Lamphear and E. Van der Sluis. "The Current Economic Impact of Nebraska's Rural Hospitals on County Economies." University of Nebraska Institute of Agriculture and Natural Resources/Center for Rural Revitalization and Community Development/Nebraska Association of Hospitals and Health Systems. (No date).

Cox, A.M., K.K. Miller, and J.K. Scott. "The Economic Importance of Health Care in Saline County." Community Policy Analysis Center, Social Sciences Unit, University of Missouri, April 1999.

Doeksen, G.A., S. Cordes, and R. Shaffer. "Health Care's Contribution to Rural Economic Development." U.S. Department of Health and Human Services, Health Resources and Services Administration, Office of Rural Health Policy, Rockville, MD. (no date).

Doeksen, G.R., T. Johnson and C.Willoughby. "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 202, Mississippi State University, 1997.

Eilrich, F.C. and G.A. Doeksen. "The Importance of the Health Care Sector on the Economy of Adair County, Oklahoma." Report prepared for the Oklahoma Rural Health Association, Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, OK, September 2001.

Eilrich, F.C. and G.A. Doeksen. "The Importance of the Health Care Sector on the Economy of Alfalfa County, Oklahoma." Report prepared for the Oklahoma Rural Health Association, Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, OK, September 2001.

Harmata, R. and R.J. Bogue. "Conditions Affecting Rural Hospital Specialization, Conversion, and Closure: A Case-based Analysis of Threat and Change." *The Journal of Rural Health*, Vol. 13, No. 2, Winter 1997.

Hart, L.G., M.J. Pirani and R.A. Rosenblatt. "Causes and Consequences of Rural Small Hospital Closures from the Perspectives of Mayors." *The Journal of Rural Health*, Vol. 7, No. 3, Summer 1991.

Hogan, C. "Patterns of Travel for Individuals Hospitalized in New York State: Relationships Between Distance, Destination, and Case Mix." *The Journal of Rural Health*, Vol. 4, No. 2, July 1988.

IMPLAN Models, MIG, Inc., Stillwater, Minnesota.

Krein, S.L., J.B. Christianson and M.M. Chen. "The Composition of Rural Hospital Medical Staffs: The Influence of Hospital Neighbors." *The Journal of Rural Health,* Volume 13. Number 4, Fall 1997.

McDermott, R.E., G.C. Cornia and R.J. Parsons. "The Economic Impact of Hospitals in Rural Communities." *The Journal of Rural Health*, Vol. 7, No. 2, Spring 1991.

Miller, J.E. "A Perfect Storm: The Confluence of Forces Affecting Health Care Coverage." National Coalition on Health Care, Washington, DC, November 2001.

Muus, K.J., R.L. Ludtke and T.D. Stratton. "Perceived Causes and Effects of Closing a Rural Hospital." *The Journal of Rural Health*, Vol. 13, No. 6, December 1994.

Ricketts, T.C. "Rural Communities and Rural Hospitals." *The Journal of Rural Health*, Vol. 15, No. 2, Spring 1999.

Rosenthal, T.C., R.A. Sobel, R.P. Graham, B. Pasley and D.C. Williams. "Swing Beds and Rural Hospitals in New York, 1991 to 1994." *The Journal of Rural Health*, Vol. 14. No. 1, 1998.

Schaffer, M.J., S. Capalbo, R. Flaherty and C. Higgins. "Community Decision-making About Critical Access Hospitals: Lessons Learned From Montana's Medical Assistance Facility Program." *The Journal of Rural Health*, Vol. 15, No. 2, Spring 1999.

Sullins R., S. Des Harnais and S. Bernard. "Community Perceptions of the Effect of Rural Hospital Closure On Access To Care." *The Journal of Rural Health*, Vol. 15, No. 2, 1999.

US Department of Commerce, Bureau of Economic Analysis. Regional Economics Information System (REIS). Washington, DC.

US Department of Commerce, U.S. Census Bureau. *2000 Decennial Population Census*. Washington, DC.

U.S. Department of Health and Human Services, Health Resources and Services Administration (HRSA). *Community Health Status Report, Genesee County, New York*. July 2000.

U.S. Department of Health and Human Services, Health Care Financing Authority (HCFA). *National Health Expenditure (NHE) Amounts by Type of Expenditure and Source of Funds: Calendar Years 1965-2010*. Washington, DC.

US Department of Labor, Bureau of Labor Statistics. *Employment and Output by Industry, 1999, 2000, and Projected to 2010*. Washington, DC. (*ftp://ftp.bls.gov/pub/special.requests/ep/ind.employment/empinddetail.txt*)

Weisgrau, S. and S.H. McDowell. "The Economic Impact of National Health Service Corps Physicians on Rural Communities." U.S. Department of Health and Human Services, Health Resources and Services Administration, National Rural Health Association, Office of Rural Health Policy, Washington, DC, January 1998.

Zimmerman, M.K. and R. McAdams. "What We Say and What We Do: County Level Public Spending for Health Care. Rural Health Policy." *The Journal of Rural Health*, Volume 15, Number 4, Fall 1999. pp. 421-431.

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