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PROLOGUE: As the pursuit of health care reform has accelerated, policymakers have become fascinated with the record of Rochester, New York, in moderating the growth of its health care expenditures and providing broader access to services than is the case nationally. No single feature of Rochester’s health care system is responsible for the community’s performance, but as authors William Hall and Paul Griner document, many forces have been at work to achieve this level of success. These forces include a long history of community-based health planning, with strong private corporate involvement, which helped to limit the expansion of hospital capacity and to control the diffusion of expensive medical technology. Another important feature has been the role of Rochester Blue Cross and Blue Shield, which insures more than 70 percent of area residents. Because of the commanding market position of the Blues, community rating-basing premiums on the experience of the entire community rather than the demographic characteristics or health status of smaller groups of enrollees has been maintained, and that has kept the cost of care affordable for more people. Hall is a professor of medicine at the University of Rochester School of Medicine and Dentistry. His chief professional interests are in continuing medical education, the use of automated information management technology, and geriatrics. Griner is Samuel E. Durand Professor of Medicine there and is chief executive officer of Strong Memorial Hospital, a 715-bed teaching institution. Griner, president of the American College of Physicians, is perhaps best known for his long-standing efforts to educate physicians to develop more cost-effective ways to diagnose illness and manage patients.
Abstract: Rochester, New York, has been cited repeatedly for having achieved one of the most cost-effective and efficient health care systems in the country. The determinants of the success of this system include a long history of comprehensive health planning; innovative hospital reimbursement programs; community-rated health insurance; and high levels of mutual cooperation among business, insurers, hospitals, and physicians. The Rochester system promotes the goals of access, quality, affordability, and provider satisfaction through a balanced approach to regulation and competition.

During the 1992 presidential campaign Rochester, New York, was cited repeatedly for having been unusually successful in developing a cost-effective, efficient health care system. In this essay we provide a historical perspective on the determinants of this success. We measure some outcomes of this system against current national norms and speculate how this system has addressed some of the undesirable marketplace issues that proposed managed care initiatives seek to modify. We identify elements that have contributed most to this success story and discuss how our national system may achieve the characteristics of an “ideal” health care model.

Characteristics Of An ‘Ideal’ Health Care System

An “ideal” health care system-defined as one that fully supports the goals of access, quality, affordability, and professional satisfaction—would have at least three major characteristics. First, there would be management of capacity to ensure that providers, facilities, and technology operate in the appropriate number, mix, and distribution. Second, there would be a system of care management, including incentives for the discriminating use of capacity. Third, the entire system would continuously improve its capacity and care management as new knowledge is gained from the analysis of effectiveness and outcomes of contemporary medical practice.

Health policy promotes this ideal system by addressing both the macro element (that is, the capacity of the system) and the micro component (that is, utilization and content, which occur at the level of patient and provider). In the 1980s national health policy moved from the principle of cost containment via regulation to an emphasis on competition as a means of incorporating market principles into the health care system. Subsequent experience over the past decade has demonstrated that the free-market system falls far short of supporting the ideal health care system just described. In response to these failures, managed competition has received broad support from the Clinton administration as the foundation for comprehensive health care reform. Alain Enthoven and others have proposed that a market-driven health system will promote efficiency and equity only if it can be regulated or managed to satisfy the following four conditions.

First, the choice of health plan must be cost-conscious. Since the current system has more incentives to consume than to save resources, it is charac-
terized by cost-unconscious demand. Health care expenditures rose from 9.1 percent of gross national product (GNP) in 1980 to 13 percent in 1990. While the price-based method of hospital reimbursement under Medicare diagnosis-related groups (DRGs) has promoted more efficient use of resources within the hospital and has moderated hospital cost inflation, it has done little to promote creative alternatives to hospitalization. Thus, current reimbursement mechanisms have only partly achieved the goal of discriminating use of capacity. Second, the free-market system must be modified to achieve both quality and economy. By the mid-1980s it was clear that pure competitive forces were not effective in managing supply. For example, there were four times as many heart transplant programs in states not requiring certificate-of-need (CON) applications as there were in states where CON regulation existed. In response, regulation has re-emerged, but with a focus at the micro level, often in the form of review of the appropriateness of individual patient encounters. The free-market system is also ill equipped to correct physician maldistribution. Amidst one of the highest physician-to-population ratios in the world, the United States continues to have a shortage of primary care physicians.

Third, the system must avert “market failure,” that is, we must find a way to keep major insurers from marketing experience-rated policies that guarantee that those who need coverage the most will not get it. Approximately thirty-five million Americans currently have no health insurance, and many millions more have only marginal coverage. Fourth, public funds must be distributed equitably to extend affordable health care to as much of the population as possible. Most workers receive employer-financed health care benefits that are completely excluded from their taxable income. This enormous tax subsidy benefits largely those who need it the least.

While these weaknesses of the health care marketplace of the 1980s may be corrected through more effective organization and management of health services under competitive models, as Enthoven and others have suggested, one should not overlook alternative systems, particularly since the managed competition model is not easily adaptable to nonmetropolitan areas and limits choice of providers. Such a system already is in place in Rochester. Rochester’s system comes as close to the “ideal system” as any in the United States and incorporates many of the principles that managed competition is designed to address.

Vital Signs Of The Rochester Health Care System In 1992

In 1992 health care costs in Rochester may have been lower than in any other community in the country. Overall health care costs, as measured by annual insurance premiums for a basic family contract, did not rise as
rapidly as the national average during the 1980s (Exhibit 1). In 1991 the total cost per employee for health care, including employee cost sharing, was $2,378, about two-thirds the national average of $3,573 and approximately 55 percent of the New York State average of $4,361. These relative cost savings do not reflect lack of access to health services. In fact, only 6 percent of the Rochester population is without insurance, compared with the national average of 14 percent." Administrative costs of the Rochester Area Blue Cross and Blue Shield amounted to 7 percent of revenues, lower than national estimates of 14-24 percent. The Rochester community enjoys a high level of satisfaction with its health care: 84 percent of the population expresses satisfaction, compared with 71 percent nationally.

Exhibit 2 depicts hospital costs per capita during 1980-1990. In 1990 hospital costs per capita were $775 in Rochester, compared with state and national costs of $1,064 and $811, respectively. Although there have been progressive incremental increases as in other parts of the country, Rochester is still considerably below both the New York State and national averages. As a result of community planning dating back to the 1950s, there are fewer hospital beds per capita in Rochester than in most other areas of the country, which results in higher levels of occupancy (87.8 percent) than in almost any other American community (Exhibit 3). These two factors translate into greater efficiency as measured by full-time personnel

<table>
<thead>
<tr>
<th>Exhibit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change In Family Health Care Costs In Rochester, New York, Compared With National Average, 1980-1991</td>
</tr>
<tr>
<td><strong>Cost index (1980 = 100)</strong></td>
</tr>
<tr>
<td>700</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>500</td>
</tr>
<tr>
<td>400</td>
</tr>
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<td>300</td>
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<tr>
<td>200</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Rochester Area Blue Cross and Blue Shield</td>
</tr>
<tr>
<td>National average</td>
</tr>
</tbody>
</table>

Source: Rochester Area Hospital Corporation.

Note: Costs for Rochester are based on the cost of a family contract issued by Rochester Area Blue Cross and Blue Shield. National costs represent the average cost for comparable medical insurance irrespective of underwriter. Rochester costs for the base year (1980) equal 100 for subsequent computation of the cost index.
per occupied bed and lower hospital costs per capita. Other studies also have confirmed lower rates of hospitalization and days of care in Rochester than in almost all other American communities. For example, James Perrin and colleagues demonstrated that rates of hospitalization for nonsurgical conditions for children in Rochester were half those of New Haven and only one-third those of Boston.\textsuperscript{10}

There is no evidence that these efficiencies have resulted in any reduction in quality of care. In fact, data support the opposite. Alvin Mushlin and colleagues, reporting on the first five years of the Rochester communitywide experiment in hospital prospective payment, which began in

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**Exhibit 2**
Comparative Change In Hospital Costs In Rochester, New York, Versus New York State And U.S. Average, 1980-1990

<table>
<thead>
<tr>
<th>Year</th>
<th>Rochester</th>
<th>New York State</th>
<th>U.S. average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>1,200</td>
<td>1,800</td>
<td>2,000</td>
</tr>
<tr>
<td>1981</td>
<td>1,400</td>
<td>2,000</td>
<td>2,200</td>
</tr>
<tr>
<td>1982</td>
<td>1,600</td>
<td>2,200</td>
<td>2,400</td>
</tr>
<tr>
<td>1983</td>
<td>1,800</td>
<td>2,400</td>
<td>2,600</td>
</tr>
<tr>
<td>1984</td>
<td>2,000</td>
<td>2,600</td>
<td>2,800</td>
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<tr>
<td>1985</td>
<td>2,200</td>
<td>2,800</td>
<td>3,000</td>
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<tr>
<td>1986</td>
<td>2,400</td>
<td>3,000</td>
<td>3,200</td>
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<tr>
<td>1987</td>
<td>2,600</td>
<td>3,200</td>
<td>3,400</td>
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<tr>
<td>1988</td>
<td>2,800</td>
<td>3,400</td>
<td>3,600</td>
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<tr>
<td>1989</td>
<td>3,000</td>
<td>3,600</td>
<td>3,800</td>
</tr>
<tr>
<td>1990</td>
<td>3,200</td>
<td>3,800</td>
<td>4,000</td>
</tr>
</tbody>
</table>

Source: Rochester Area Hospital Corporation.

Note: Average cost per diem per capita.

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**Exhibit 3**
Selected Characteristics Of The Rochester, New York, Hospital System, Compared With New York State And U.S. Average, 1991

<table>
<thead>
<tr>
<th>Area</th>
<th>Beds per thousand</th>
<th>Occupancy (percent)</th>
<th>Hospital cost per capita (dollars)</th>
<th>Hospital admissions per thousand per year</th>
<th>Full-time-equivalent staff per occupied bed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rochester</td>
<td>3.18</td>
<td>87.8%</td>
<td>$775</td>
<td>103.4</td>
<td>3.28</td>
</tr>
<tr>
<td>New York State</td>
<td>4.14</td>
<td>85.9</td>
<td>1,064</td>
<td>112.7</td>
<td>3.74</td>
</tr>
<tr>
<td>US. average</td>
<td>3.73</td>
<td>66.7</td>
<td>811</td>
<td>109.5</td>
<td>4.20</td>
</tr>
</tbody>
</table>

Source: Rochester Area Hospital Corporation.

\* According to American Hospital Association statistics for 1991 (total full-time-equivalent personnel per adjusted average daily census).
1980, found that access to necessary care was maintained and possibly improved.\textsuperscript{11} While rates of inpatient surgery declined, admission rates increased for certain nondiscretionary acute illnesses such as myocardial infarction and complicated maternal illness. Various outcomes of care for a wide variety of medical and surgical conditions remained unchanged.

**Determinants Of Rochester's Success**

The success of Rochester’s health care system cannot be ascribed to any one factor. However, certain features stand out as potentially important.

**Health care planning.** Continuous dialogue about health care delivery in Rochester has taken place for the past fifty years. Formal planning organizations have been in existence since the 1950s. In the late 1970s an umbrella corporate entity was formed to help to coordinate planning and reimbursement for hospital services (the Rochester Area Hospital Corporation, or RAHC). This was a local, voluntary effort that, in conjunction with statewide CON requirements, continued to foster moderation in the capacity and costs of health care facilities (Exhibit 3).

**Community-rated health insurance.** Almost all contracts offered by local Rochester insurers are community rated and have been so since the early 1940s. Approximately 95 percent of all health insurance coverage in Rochester is by local insurers, with Blue Cross holding approximately 80 percent of the market. As a result, both small businesses and self-employed individuals in the region can purchase essentially the same level of coverage at the same rates given to the largest corporations.

**Cooperation and innovation.** There is a long history of cooperation and innovation among the various parties interested in health care in Rochester. During the 1980s this cooperation marked the first time that a group of U.S. hospitals voluntarily committed themselves to a regional financing system affecting all hospital care. As noted earlier, the groundwork for these events began thirty years before.

Throughout the 1950s and early 1960s Rochester was already noted for low inpatient bed use rates, but by the early 1970s, as in other parts of New York State, per diem costs were beginning to rise rapidly. These increasing expenditures may have been related more to external than to local factors, such as the massive out-migration of industry from New York State and the resultant fiscal crisis of New York City as well as the shared costs of the country’s most generous Medicaid program. At that time the legislature granted increasing regulatory powers to the New York State Department of Health over Blue Cross to encourage hospitals to economize operations further. The Department of Health subsequently applied stringent Medicaid hospital reimbursement rates to Blue Cross per diem rates. By the
mid-1970s virtually all New York hospitals were operating at a deficit; the impact was especially severe in Rochester because of a low ratio of hospital beds to population and relatively high per diem costs. To address these fiscal problems, a committee made up of principals of area hospitals was established to develop a prospective budget for these hospitals by pooled single-source funding. For a variety of reasons, which have been described elsewhere, this initiative did not come to early fruition, although the community planning groups remained intact and active.12 Finally, in 1978 the RAHC was incorporated as a formal nonprofit agency. Its board comprised representatives from each of the original nine acute care hospitals and from the University of Rochester School of Medicine and Dentistry.13

Effective 1 January 1980 the RAHC initiated the Hospital Experimental Payments Program (HEPP), which was a unique example of community cooperation to develop a single-source, communitywide prospective hospital payment system. The inaugural principles of HEPP were as follows: (1) Hospital cost containment is accomplished most effectively by incentives within the payment system as opposed to external sanctions; (2) hospitals should be paid for output rather than input used in the production of output; (3) hospitals should be held accountable for those incremental costs that are within their control and not for those that are not; and (4) individual hospitals should be able to project revenue in advance.14

Under the HEPP agreement local hospitals accepted an individual and regional cap on hospital income derived from all payers, including Blue Cross, Medicare, and Medicaid. The allowable cost base for each hospital was computed from actual costs prior to implementation of the RAHC adjusted by inflation trend factors. The original contract also included a 2 percent contingency fund to cover projects approved through the CON process. More detailed description of this cost-based computation has been published previously.15 Although HEPP primarily regulated hospital revenues, cost control was achieved through the cap on inpatient revenue and adjustments for hospital-based outpatient services, which eliminated dis-incentives for substitution of outpatient for inpatient services. When any given hospital realized a surplus of revenue over cost, the hospital retained this surplus (an incentive to promote efficiency). At the same time, all hospitals agreed to participate in the generation and maintenance of a communitywide database, which has continued for over a decade and has been an invaluable resource for community planning, evaluation of quality of care, and studies of health care use. Over the first five years of this experiment the increase in Rochester-area hospital expenses was 46 percent, compared with 52 percent for New York State and 68 percent for all U.S. hospitals. Rochester hospitals improved their operating margins by 2.6 percent, compared with a deficit of 15.8 percent for all New York State
hospitals. No evidence of inadequacies in quality or access was found.\textsuperscript{16}

In 1985 a modification of the payment plan, known as HEPP II, was put into place. HEPP II retained the essential features of the original HEPP but included several important changes. A communitywide revenue cap was extended to capital costs. Pro rata allocation of certain components of hospital costs across the community was implemented, including the costs of medical education, charity care, and certain aspects of capital. In addition, a formula for case-mix revenue adjustments was introduced.\textsuperscript{17}

Pressures were mounting in 1987 from both state and federal sources to fold Rochester into the DRG-based prospective payment system (PPS), from which the community had been waived. Some local hospitals also believed that their revenues might be enhanced under the Medicare DRG system, compared with the Medicare component of HEPP. The HEPP III payment system was designed during this community transition from prospective to per case hospital payment. This new plan linked attainment of quality benchmarks with payment incentives.\textsuperscript{18} This was accomplished by shifting the focus of utilization and quality review from structure and process to outcomes and by replacing punitive approaches with positive incentives. Finally, in 1989 New York State moved to an all-payer DRG payment system, and no further waivers were granted to Rochester. However, the elements of community planning, which by now have a fifty-year history in Rochester, continue with widespread support.

Community-based health services. Community health services are well organized throughout the Rochester community and provide ambulatory options not available in many other communities. Most are not-for-profit. Hospital admission rates are low compared with those in the nation at large and may be related in part to ease of follow-up and the provision of necessary services without using the hospital. Similarly, case management strategies for frail elderly, such as the Monroe County Long Term Care Program (better known as ACCESS), have achieved national recognition for innovation and effectiveness.\textsuperscript{19} There is also a long tradition of effective neighborhood health centers that offer access to care for the poor throughout the city.\textsuperscript{20} Community mental health centers provide comprehensive services throughout the county.

Managed care. Approximately 65 percent of the employed population in Rochester is enrolled in managed care programs, principally individual practice association (IPA)-model health maintenance organizations (HMOs). Only two major local insurers offer these plans, so destructive competition is less significant here than in some other major markets. These organizations support management of capacity at a macro level and promote management of demand at a micro level. The micro-level management tends to be less intrusive because there is a premium on hospital beds
and fewer concerns about inappropriate hospitalization or length-of-stay.

**Physician characteristics in the Rochester area.** The organization of medical practice in Rochester favors community-based primary care providers in small groups, while subspecialists are more closely aligned with hospitals. There are no large fee-for-service multispecialty groups at present in the Rochester area, and multihospital privileges for physicians is the rule rather than the exception. Physicians maintain a high level of communication with insurance carriers and hospital administrative staffs.

**Impact of the School of Medicine and Dentistry.** A less tangible but in our opinion very important factor in the success of the Rochester health care system has been the influence of the community’s medical education system. The University of Rochester School of Medicine and Dentistry is the only medical school in the region. All Rochester community hospitals have an academic affiliation with the university. Major departments at these hospitals are headed by physicians with full-time academic appointments. In fact, over one-third of the medical school’s full-time faculty are among these affiliates. Furthermore, more than half of the community’s physicians have meaningful part-time faculty appointments, in that they participate in sponsored teaching programs. An unusually high concentration of physicians receive postgraduate education in the Rochester system. Each year approximately 400 medical students and 500 residents and fellows use the 2,000 teaching beds in Rochester hospitals. These trainees provide a subtle yet extremely effective form of quality assurance and ensure that any aberrant hospital practices will be questioned. At the very least, this high concentration of physicians in training in a community with the lowest health care costs nationally suggests that a reduced commitment to medical education will not necessarily lead to lower health care costs.

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**Implications For National Health Policy**

What lessons does the experience of a single community hold for the debate on national health care policy? The Rochester experience may show the way to develop the infrastructure necessary for most of the characteristics of an ideal system. We believe that the Rochester model addresses many of the key efficiency and equity factors that the Enthoven concept of managed competition seeks to redress (Exhibit 4). The Rochester system also includes the three elements of an ideal system. First is the management of capacity through local planning and oversight. Through the various planning modes described above, a close approximation of the right mix of facilities, technology, and providers has been achieved. When patient demand occasionally exceeds supply, priorities are established, sometimes explicitly (for example, for intensive care unit beds) but more often implic-
### Exhibit 4

**Important Elements Of A Managed Competition-Based Health System, As Addressed By The Rochester, New York, Health System**

<table>
<thead>
<tr>
<th>Managed competition element</th>
<th>How addressed by Rochester</th>
</tr>
</thead>
</table>
| Cost-conscious demand (key decision-makers have incentive to seek value for money in health care purchasing) | Ability of hospitals that reduce costs to realize a profit  
Vested interest on the part of business leaders to obtain health value for entire community  
High penetration of managed care systems  
Well-developed community services as alternative to hospital-based services |
| Health care financing and delivery systems organized for quality and efficiency | Lowest ratio of hospital beds to population in the United States  
Physician distribution that favors community-based primary care providers  
Rationalized distribution of costly specialized services (such as open-heart surgery)  
Hospital payment system that rewards quality outcomes  
Payment system that supports a comprehensive database and research on outcomes and efficacy  
High penetration of managed care (65 percent of employed population) |
| Guards against market failure (market for health insurance produces results that are fair and efficient) | System of community rating with a fifty-year history of success  
Most insurance underwritten by dominant carrier (Blue Cross)  
State-mandated Medicaid benefits among the most comprehensive in the nation |
| Equitable and efficient distribution of public funds to motivate widespread coverage | Low rate of uninsured persons (6 percent)  
Tradition of comprehensive neighborhood health centers to provide full scope of health care to underprivileged persons  
Redistribution of charity care and bad debt services over entire community |


Physicians and patients adapt to this constraint, achieved through macroregulation, far better than to the intrusive regulation and oversight that occurs at the level of the individual patient encounter. Second, predictability of expenditures for health care through a cap on revenue to providers also leads to more discriminating use of resources. Rochester had such a system for a decade, and we anticipate the return to such a system. Third, Rochester has a good start on the constant upgrading of patient care through better knowledge of the effectiveness of medical practice. We believe that the commitment of Rochester hospitals to a program of continuous quality improvement, including a shared clinical database with which to examine patterns of care, serves as a model for other areas.

It is often asked what elements of the Rochester experience might be
applicable in communities that do not share some of the features that have contributed to Rochester’s success (such as a half-century of planning, a relatively consistently robust economy, and a single academic medical center). The question may be of particular importance since the population of the Rochester area is lower than the 1.2 million population that has been suggested as a minimum for a fully functional managed competition system and is therefore representative of the population density of the communities where 63 percent of Americans reside. The Rochester health care system addresses the major goals of managed competition in a manner that capitalizes on local strengths that are present or could be developed in most other organized urban communities. First, major business and industrial leaders must be willing to take a community view of health and support community-rated health insurance to ensure access to care for all segments of the community. The enlightened self-interest that should motivate this position is the prospect of losing local control if local initiatives cannot match or exceed national standards of access to care and cost control. Second, hospitals must cooperate, which in Rochester has allowed competition to express itself mainly through approaches to improved quality of care. Third, physician providers and insurance carriers must work together for interests that extend beyond costs and reimbursement to address community needs. Finally, academic medical centers, which have traditionally seen their clinical role as one of providing high-technology care, must have the intellectual and educational resources to become active members of these community partnerships.

Communities that are seeking solutions to the problems of excessive health care costs, large numbers of uninsured individuals, and variable quality might do well to examine the principles of both managed competition and communitywide cooperation achieved in Rochester. These models are not mutually exclusive. Excess capacity may require a heavily competitive approach in some communities and may be amenable to cooperative approaches in others. Still others may find that an approach using elements of both models holds promise. In all cases the lessons learned from the experience in Rochester should help all communities to address the elusive goals of access to, quality of, and affordability of health care.

This work was supported in part by the Rochester Area Pepper Center Grant (AG10463) from the National Institute on Aging.
NOTES


5. Personal communication, Rochester Area Blue Cross and Blue Shield; data for New York State and United States provided by the American Hospital Association.

6. Ibid.

7. Ibid.

8. Personal communication, Rochester Area Hospital Corporation.

9. Ibid.


11. A.I. Mushlin et al., “Quality of Care during a Community-Wide Experiment in Prospective Payment to Hospitals,” Medical Care 26, no. 11 (1988): 1081-1089.


13. Ibid.


16. Ibid.


