“McFlu”

The Monroe County, New York, Medicare Vaccine Demonstration

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Background: Monroe County (MC) NY was one of 9 original sites for the 1988–1992 Medicare Influenza Vaccine Demonstration, which led to Medicare coverage of annual influenza vaccination. The “McFlu” project involved collaboration among university, health department, and practice community.

Methods: Community-wide systems for promoting and/or documenting influenza vaccine delivery and for conducting laboratory-based influenza surveillance were established in MC and in neighboring Onondaga County (OC), which served as a comparison site without Medicare coverage of vaccination. Vaccination utilization and virologic surveillance data collected from physician practices, hospitals, and nursing homes were furnished to national demonstration evaluators.

Results: Influenza vaccination rates among persons ≥65 years of age increased from 41% to 74% in MC compared to an increase from 46% to 57% in OC. The greatest increase occurred in physician offices utilizing an innovative vaccination promotion and tracking strategy. Community-wide influenza A/H3N2 and B outbreaks were documented in three successive demonstration years, affording investigators the opportunity to better define influenza impact and vaccine effectiveness among the Medicare population.

Conclusion: The McFlu project exemplifies the potential for linking the academic and public health sectors to complement each others’ strengths in planning, implementing and documenting a targeted program for improving community health. This model of medicine and public health collaboration should be applicable to attaining other well articulated goals for the health of the public.


Introduction

The 1987 Omnibus Budget Reconciliation Act called for the Secretary of Health and Human Services to conduct a four-year nationwide demonstration project to “test the cost-effectiveness of furnishing influenza vaccination under Medicare B.” The legislation allocated $25 million a year from the Medicare Trust Fund to support the demonstration. The Health Care Financing Administration (HCFA) and the Centers for Disease Control and Prevention (CDC) developed a design for conducting community-wide demonstrations, issued a request for proposals (Federal Register, July 14, 1988), and in September made awards to nine demonstration sites, including Monroe County, New York (see Appendix). This paper briefly describes the background and design of the national demonstration and provides an in-depth case study of its implementation in Upstate New York. This experience illustrates effective community-wide collaboration among academic, public health, and medical care sectors, which resulted in the 1993 decision to make annual influenza vaccination a standard Medicare benefit.

Background

Annual epidemic influenza causes some 10,000–40,000 excess deaths and 150,000–200,000 excess hospitaliza-
tions, over 80% of which involve persons over 65 years of age. Influenza vaccine has been shown to be 60%–80% effective in protecting against such influenza-associated hospitalizations and deaths among older persons. The U.S. Public Health Service Advisory Committee on Immunization Practices (ACIP) has for many years recommended annual influenza vaccination of all persons over age 65. In spite of these recommendations, reinforced by the Surgeon General’s goal for the year 1990 to attain annual influenza vaccination of at least 60% among older persons, only 25%–30% received annual vaccinations according to surveys during the 1970s and 1980s. One oft-noted barrier to receipt of influenza vaccination by older persons was the lack of Medicare reimbursement for this preventive service. With a view toward overcoming this barrier in a fiscally accountable way, Congress created the Medicare Influenza Vaccine Demonstration.

The demonstration utilized a concurrent quasi-experimental study design involving intervention and comparison communities, as illustrated in Figure 1. In 1988, nine geographically dispersed demonstration sites were selected, each comprising intervention and comparison communities with large Medicare populations, as listed in the appendix. The target population was the entire Medicare B enrollment (over 90% of all Medicare beneficiaries) in each participating community. The intervention communities received Medicare funds to provide enhanced public promotion and fee-for-service reimbursement of influenza vaccination while comparison communities continued their usual influenza vaccination practices without Medicare reimbursement. Researchers hypothesized that vaccination levels would be substantially higher and pneumonia hospitalization rates would be commensurately lower in the intervention communities during the influenza seasons.

Extensive vaccination survey data, influenza surveillance data, and influenza-related morbidity data were collected in the respective intervention and comparison communities over four successive influenza seasons between 1988 and 1992. The initial demonstration year (1988–1989) was devoted to developing and piloting systems for vaccine promotion and reimbursement and influenza surveillance in all demonstration sites. The subsequent three demonstration years were intended to achieve full implementation of the design. Data collected from all demonstration sites for the period 1989–1992 were furnished to Abt Associates, an independent research contractor, to use for the final cost-effectiveness analysis.

A number of published studies from the Monroe County demonstration focus on selected aspects of vaccination delivery, vaccine effectiveness, and influenza surveillance. The present paper focuses on the full network of collaborative arrangements that were developed among academic, public health, and medical care sectors to conduct the demonstration and document its achievements. We review the setting and organizational structure of the demonstration, the steps taken to implement and manage the various components, and selected quantitative measures of accomplishments.

### Setting

The Monroe County Medicare Influenza Vaccine Demonstration involved Monroe County, NY (1985 population estimate 712,000 with 85,000 over age 65) as the intervention community, and Onondaga County, NY (1985 population estimate 463,000 with 58,000 over age 65) as the comparison community. These two Upstate New York counties each center on a moderate-sized metropolitan area (Rochester and Syracuse, respectively), surrounded by small towns and rural areas. Demographic and major medical resources and utilization patterns for older persons were very similar between the two counties, hence meeting criteria for being a demonstration site. Furthermore, community surveillance conducted by university-based virology laboratories in the latter 1980s in both communities showed very similar patterns of annual influenza activity. Prior to the demonstration, both county health departments had taken an active interest in influenza vaccination of older persons.

At the outset, a readily recognizable acronym with

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Figure 1. Conceptual model for multisite Medicare Influenza Vaccine Demonstration project.
logo, “McFlu,” was adopted for the Monroe County Medicare Influenza Vaccine Demonstration (Figure 2). Organizational and preventive medicine at the University of Rochester and in Onondaga County Health Departments and faculty in several departments of the University of Rochester and the State University of New York (SUNY) Health Science Center, Syracuse. The Monroe County Health Department (MCHD) was responsible for implementing the entire vaccination promotion component of the demonstration, working with practicing physicians, hospitals, nursing homes, health maintenance organizations, voluntary agencies, and various media. Through a subcontract with the department of medicine at one large university-affiliated community hospital, an innovative strategy for improving vaccination performance in physicians’ offices was developed.11

Multi-level influenza virus surveillance involving medical practices, hospitals, and nursing homes was implemented in Monroe County by members of the departments of preventive medicine, medicine, pediatrics, microbiology, and biostatistics at the University of Rochester and in Onondaga County through collaborative efforts between the county health department and the departments of pediatrics and microbiology at SUNY (Syracuse).

Implementation, Management and Output

An overall planning and management group consisted of the principal investigator, a fulltime faculty member of the University of Rochester (U of R); the co-principal investigator, deputy director of the MCHD; several co-investigators at the U of R, SUNY (Syracuse) and the Onondaga County Health Department; and staff coordinators for the vaccine promotion and the surveillance arms of the project. This management group met monthly, August through April, each year to plan, implement, track, and modify the operations. Early each summer, a retreat was conducted to assure completion of data synthesis from the previous demonstration year and to plan the subsequent year. The PI, Co-PI, and lead staff persons for vaccine promotion and surveillance participated in annual, two-day, national meetings of leaders from all demonstration sites.

Project participants, including public health graduate students, made numerous presentations at local and national meetings and published a number of papers from the project, as noted above.

Vaccine Management

The MCHD supplied vaccine to all participating providers and routinely submitted utilization data to HCFA and CDC for purposes of reimbursement and accountability, as depicted in Figure 4. Vaccine distribution required enlistment of eligible care providers from a number of sectors, as shown in the figure, and estimation of the number of Medicare beneficiaries served for each.

Participation by primary care physicians increased steadily over the years, from 52% the first year to 85% the final year of the demonstration. All but two of the 33 nursing homes in the county, with a combined population of 5,200 residents, participated throughout the project. Hospital inpatient services were not enrolled as provider sites because of extensive administrative steps that would have to be taken; however, outpatient clinics were included. One group model and two independent practice association (IPA) model health maintenance organizations, with some 16,000 Medicare enrollees among them, were initially ineligible since their contracts already included influenza vaccination as a benefit. Because HMO non-participation was confusing to patients and providers, particularly in the IPA models, and made it difficult to assess community-wide impacts of the demonstration, administrative arrangements were made with HCFA to include the plans and their Medicare enrollees during the second and third demonstration years.

Reimbursement was originally implemented as a traditional decentralized system with providers submitting individual claims to a Medicare carrier, using a specially assigned influenza vaccination code. Because implementation of this special code often resulted in minor inaccuracies and claims rejection rates of up to 25%, the MCHD implemented a centralized system for collecting, checking, and submitting all claims. The claims rejection rate declined to less than 1%, an attainment that won praise from the provider community and was emulated by other demonstration sites.
Vaccine Promotion

A wide array of public relations activities to promote influenza vaccine as a new Medicare benefit were implemented by the MCHD. These included extensive multi-media public service announcements and a campaign targeted to urban minority communities and involving local church, health center, and media leadership. Also, informational letters encouraging influenza vaccination were sent with Social Security mailings to all Medicare enrollees in the county. There was no formal evaluation to measure the impact of these promotional strategies.

To enhance primary care physician performance in immunizing the older patients in their practices, a target-based, denominator-driven strategy was developed and evaluated under the aegis of the Department of Medicine at the Genesee Hospital, a U of R-affiliated community hospital. The strategy consisted of assisting physicians in enumerating their entire panel of active Medicare patients and providing a simple poster for
charting cumulative percent immunized between early September and the end of December. A series of published studies documents the pilot stage of the project and two successful randomized trials involving physicians throughout the county who were variably offered posters and, in some instances, financial incentives, as means of boosting delivery of influenza vaccination.12,13

Proportion of Medicare enrollees 65 years of age receiving annual influenza vaccination increased steadily in Monroe county from 41% in the initial year of the demonstration to 74% two years later, while a more modest increase from 46% to 57% occurred in Onondaga county. As shown in Figure 5, total vaccine provided in physician offices under both fee-for-service and HMO/IPA reimbursement models increased dramatically over time while the amount delivered in public clinics and nursing homes remained relatively stable. The major increase in proportion of vaccine provided in physicians’ offices correlated with the increase in numbers of physicians involved in the performance-based poster project, from 45 in the first year to 206 the second year and 249 the third year.

**Surveillance**

Laboratory-based influenza surveillance involved close collaboration between academic and public health colleagues. As depicted in Figure 6, systems for identifying influenza activity were established involving hospitals, nursing homes, pediatric and adult medicine practices, and vital statistics offices in both counties. Based on past experience in the demonstration counties as well as elsewhere, it was recognized that earliest or “sentinel” indications of the annual appearance and persistence of influenza would be detected in the ambulatory practice setting, particularly pediatrics. This surveillance information therefore delineated the period of time within which to focus HCFA-CDC cost-effectiveness analysis. Hospital and nursing home surveillance focused specifically on the occurrence of influenza among older patients to allow direct study of the impact of the demonstration on the target Medicare population.

Surveillance systems were operated by infectious disease academicians with clinical and laboratory exper-
tise in respiratory viral disease, based at the U of R and SUNY (Syracuse) medical centers. These co-investigators, through existing channels of communication with practicing physicians, hospital admission and utilization review offices, and nursing home infection control offices, were able to effectively implement an extensive multi-level surveillance network. This included several large pediatric practices, over twenty adult medicine practices, six acute care hospitals, and approximately thirty-five nursing homes combined between the two counties.

To assure consistent quality of specimen collection and documentation, which involved voluntary participation by staff at the surveillance sites, a detailed “McFlu Surveillance Procedures Manual” was developed. Practice-based surveillance focused on patients with acute febrile respiratory illness; hospital surveillance obtained viral cultures on older patients admitted with diagnoses of pneumonia, decompensated chronic obstructive pulmonary disease, or congestive heart failure preceded by febrile respiratory tract illness; nursing home surveillance targeted potential outbreaks, defined as clusters of two or more residents with concurrent onset of acute febrile respiratory illness. Over three years of the demonstration, 4043 specimens were obtained from all sites combined. Virology laboratories at both academic medical centers adapted existing diagnostic and research operations to process this high add-on volume of specimens to support the demonstration’s public health purpose.

All surveillance data were computerized at the University of Rochester and transmitted biweekly to Abt Associates to be used in the national evaluation of the demonstration. Surveillance data were distributed to co-investigators at monthly intervals for review and addition of follow-up clinical information.

**Selected Findings**

A discrete influenza period was identified by practice surveillance in both counties during each of the three demonstration years (Figure 7). One viral subtype was dominant each year (A/H3N2 in 1989–1990 and 1991–1992; B in 1990–1991) and matched patterns documented elsewhere in the United States.20,21 During each year, the epidemic influenza strains were isolated from substantial numbers of hospitalized older patients as well as from patients involved in focal outbreaks in nursing homes. Overall yields of influenza virus from all surveillance specimens for the three successive demonstration years were 228/1240=18%, 200/1659=12%, and 347/1144=30%, respectively.15 Several informative laboratory-based substudies of the impact of influenza among older persons were conducted. A series of case-control studies documented vaccine effectiveness ranging between 44% and 90% protection against hospitalization with influenza-associated diagnoses.14 Hospital surveillance also identified respiratory syncytial virus to be an unexpectedly common etiologic agent mimicking influenza and possibly confounding influenza vaccine effectiveness studies.22

Nursing home surveillance identified focal outbreaks caused by the A/H3N2 and B subtypes of influenza in the 1989–1990 and 1990–1991 surveillance years, respectively. While attack rates were higher for the A/H3N2 than for the type B virus (40% versus 25%), clinical severity of the two virologically distinct illnesses was identical.23 A further observational study derived from nursing home surveillance found that among residents with laboratory-confirmed influenza A/H3N2 illness who survived for at least four months, 9% experienced permanent decline in one or more basic activities of daily living attributable to the influenza illness.24

**Presentations and Publications**

In addition to numerous local presentations and publications in support of the project, McFlu investigators and staff made invited presentations at a number of national public health and academic meetings, including periodic reports to HCFA’s Technical Advisory Group for the demonstration; presentations at three...
CDC annual immunization conferences, one of which received an award for best program (1992); presentations at the Infectious Disease Society of America, the American Society for Microbiology, and the 1992 International Conference on Options for the Control of Influenza at Courchevel, France. Symposia that highlighted collaboration between university and health department investigators were presented at the 1990 annual conference of the Gerontological Society of America25 and at Prevention '92.

Two project staff, who were master of public health students at the time of the demonstration, conducted extensive literature reviews on surveillance systems (Christine Long, MPH) and on strategies for enhancing vaccine delivery (Ruth Kouides, MD, MPH) which contributed to demonstration operations and served as MPH electives. Both of these former graduate students authored or co-authored several published articles from the demonstration.

Discussion

The McFlu project was conducted in response to a national call for community-wide demonstration projects to support a study of the cost effectiveness of reimbursing a universal clinical preventive service, influenza vaccination, by Medicare. The resulting collaboration among university-based epidemiologic and laboratory expertise, health department accountability, and experience with community-wide programs, and medical care sector delivery of clinical preventive services has been referred to as the “new three-legged stool” model for achieving population health goals.10 Implied in this model, and eminently well-illustrated by McFlu, is recognition that no one of the three sectors could effectively accomplish the task by itself. Working together indeed constituted a successful synergy as manifest in the high rate of influenza vaccination attained among the target Medicare population and in the informative documentation and insight into the public health impact of influenza and strategies for its prevention among older persons in a variety of settings.

The success of collaboration may be attributable to several favorable factors. First, the serious health risk of influenza and the desirability of preventing this among older people are universally acknowledged and non-controversial. Second, Monroe County has a legacy of mobilizing cooperative approaches to delivery of health services.26 Third, the Health Care Financing Administration, which traditionally focuses on reimbursement but not delivery aspects of services, made an explicit

Figure 6. Communitywide Laboratory-Based Influenza Surveillance Systems in Monroe and Onondaga Counties (New York).
commitment in this demonstration to engage the public health sector, ranging from the CDC to local and state health departments, in addressing infrastructure as well as financing for promoting and delivering the service.

The broad, enduring significance of the McFlu project, and the collaborative approach that it reflects, have been recognized in several ways since completion of the formal demonstration. An article on HCFA’s new Consumer Information Strategy cites the Monroe County experience as a model to emulate in mobilizing consumers and providers to improve delivery of influenza vaccine to Medicare enrollees.27 In connection with the Medicine/Public Health Initiative recently launched by the AMA28 and APHA29 the McFlu project was selected from over 400 case studies reviewed by the New York Academy of Medicine as exemplary of emerging “synergies” for achieving public health goals through clinical service delivery.30 Lastly, in line with the Association of American Medical College’s recent emphasis on academic medical center attention to population health,31 in 1997, the Dean of the University of Rochester School of Medicine and the Monroe County Health Department established a formal collaborative Center for Study of Rochester’s Health inspired by the McFlu experience.

We acknowledge the critical contribution of the many participating practicing physicians, hospitals, and nursing homes in Monroe and Onondaga Counties: virology laboratory personnel at the University of Rochester and SUNY(Syracuse); and many other colleagues and staff at the health department and academic medical centers in the respective counties.

This work was conducted under support of PHS grant H53/CCH20399401.

References
1. Meitl JF. Influenza immunization for Medicare eligibles: a demonstration for cost-effectiveness. In: 22nd National Immunization Conference Pro-

**Figure 7.** Virologic Documentation of Influenza in Pediatric and Adult Medical Practices in Monroe and Onondaga Counties (New York) 1989-1992.


### Original Nine Sites for Medicare Influenza vaccination Demonstration: Grantee Intervention and Comparison Areas, Including Major Urban Centers ( ) and Populations of Persons ≥ 65 Years old According to Census Estimates

<table>
<thead>
<tr>
<th>Grantee</th>
<th>Intervention Area</th>
<th>Comparison Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maricopa County (Arizona) Department of Health Services</td>
<td>Maricopa County (Phoenix) 222,000</td>
<td>Pima County (Tucson) 76,000</td>
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<tr>
<td></td>
<td>Maricopa County (Phoenix) 91,000</td>
<td>Worcester County (Worcester) 93,000</td>
</tr>
<tr>
<td></td>
<td>Essex County (Lynn, Salem) 88,000</td>
<td>Kent, Muskegon, &amp; Ottawa Counties (Grand Rapids) 93,000</td>
</tr>
<tr>
<td>Michigan State Department of Public Health</td>
<td>Calhoun, Ingham, Jackson, &amp; Kalamazoo Counties (Lansing, Battle Creek) 88,000</td>
<td></td>
</tr>
<tr>
<td>University of Rochester (New York) Medical Center</td>
<td>Monroe County (Rochester) 93,000</td>
<td>Onondaga County (Syracuse) 61,000</td>
</tr>
<tr>
<td>North Carolina Department of Human Resources</td>
<td>A. Alexander, Burke, Catawba, Caldwell, Cleveland, Gaston, Lincoln, Mecklenburg, &amp; Union Counties (Charlotte) 235,000</td>
<td>Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry, &amp; Yadkin Counties (Winston-Salem, Greensboro) 135,000</td>
</tr>
<tr>
<td></td>
<td>B. Durham, Edgecombe, Franklin, Johnston, Lee, Nash, Orange, Wake, &amp; Wilson Counties (Raleigh-Durham, Chapel Hill) 93,000</td>
<td></td>
</tr>
<tr>
<td>Ohio State Department of Health</td>
<td>Summit &amp; Stark Counties (Akron, Canton) 127,000</td>
<td>Franklin County (Columbus) 97,000</td>
</tr>
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<td>Oklahoma State Department of Health</td>
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<td>Kansas (entire state) 347,000</td>
</tr>
<tr>
<td>Allegheny County (Pennsylvania) Health Department</td>
<td>Allegheny County (Pittsburgh) 226,000</td>
<td>Luzerne &amp; Lackawana Counties (Wilkes-Barre, Scranton) 108,000</td>
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<tr>
<td>San Antonio (Texas) Metropolitan Health District</td>
<td>Bexar County (San Antonio) 99,000</td>
<td>Bell, Coryell, McLennan, Travis, &amp; Williamson Counties (Austin, Waco) 89,000</td>
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Several more demonstration sites were enrolled between 1989 and 1991. (Information furnished by Abt Associates, Cambridge, Massachusetts.)