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THE UNITED STATES SWINE
INFLUENZA IMMUNIZATION
PROGRAM: A NEW YORK CITY
PERSPECTIVE

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ON March 24, 1976 President Gerald Ford announced a \$135 million program to immunize every man, woman, and child in the United States against swine flu. From the outset, the program was surrounded by controversy and plagued by problems ranging from delays in vaccine production to malpractice insurance difficulties. This program was the largest mass vaccination program ever undertaken in the United States, and can be defended or criticized depending on one's interpretation of the evidence and its implications.¹⁻¹¹

The program was a unique experience for most public health agencies in the country because of its magnitude, complexity, and controversial nature. A number of problems surfaced which had been developing over the past several years in immunization programs. Prominent among these were

the malpractice problem and the question of signed informed consents, but the program also uncovered a number of other issues for public health officials. It clearly demonstrated that public acceptance could no longer be predicted as a natural consequence of official recommendations. An informed and discriminating public weighed information given by the press and media and the majority clearly opted for action opposite to that of official opinion. In part this was made possible by the size of the American media and press infrastructures which gave the program intense coverage. Public health officials also learned, if they had not done so before, that complex technical information had to be interpreted to the general public in understandable terms and in a timely fashion.

Congress approved the president's program and voted the necessary \$135 million, \$107 million of which was to produce vaccine and the remaining \$28 million to deliver the program. Federal legislation provided for the vaccine to be given to the 50 state health departments and to New York City in quantities sufficient for their populations. In addition, monies were given to local health departments to administer the program, monies that amounted to about 14 cents per dose. The actual average cost to administer a dose of vaccine amounted to about 50 cents, which meant that local health departments had to absorb the additional 36 cents per dose cost themselves. There was much criticism of the federal program on this account by local health departments.⁴

ORGANIZING A MASS VACCINATION PROGRAM FOR NEW YORK CITY

The federal government defined broad guidelines for the program, but left the organization, planning, and administration of the program to individual state health departments.¹² Federal guidelines required a coordinating committee, participation by the private medical sector, utilization of volunteers, public health education and public awareness programs, training of personnel in cardiopulmonary resuscitation and the use of automatic jet injectors, assessment of vaccine utilization, obtaining a signed informed consent for all those to be immunized, and surveillance for the disease and for reactions to the vaccine.

The organization of this program for New York City was discussed intensively within the executive level of the department of health in early April. As a result, the commissioner of health made the following recommendations to Mayor Abraham D. Beame: Establish a New York City swine influenza immunization task force to include representatives from

industry and commerce, the voluntary, proprietary, and municipal hospital systems, the private medical sector, academic medicine, the American Red Cross, and other volunteer groups and specialists from within the Department of Health and establish a special swine influenza immunization unit within the Department of Health to administer the program.

On April 4, 1976 the mayor announced formation of the task force and appointed the first deputy health commissioner as chairman. The task force had 25 members, about half of whom were professional staff of the Department of Health. The directors of bureaus whose staff would be involved in the program were appointed to the task force, including the directors of public health nursing, child health, school health, laboratories, preventable diseases, district health services, the immunization program, and public health education.

The task force met a week after its formation to formulate general policies and directions for the program. At that time there were still many ambiguities at the national level concerning the starting date, vaccine availability, target population and malpractice insurance. The task force decided on a policy of immediate and detailed planning and organization of a program for the entire population, so that, being fully prepared to do the maximum, the city could do less if necessary. Health-department members of the task force formed a committee to implement the program, and approved of the following general guidelines:

The full participation in the program by private physicians and other health care providers, the utilization of volunteers and other community resources, coordination of the influenza program with ongoing immunization activities, professional education and public awareness activities, a training program for staff and volunteers, the establishment of a vaccine storage, supply and delivery system, programs for high risk groups and the rest of the population, the continuous assessment of vaccine utilization, surveillance for disease and vaccine reactions and the use of signed informed consent forms.

PROGRESS OF PROGRAM PLANNING AND ORGANIZATION

The national program was initially scheduled to begin in July, but in mid-June the four pharmaceutical firms producing the vaccine announced that they were losing malpractice liability insurance, and stopped making vaccine. The Department of Health, Education and Welfare then asked Congress to indemnify the vaccine producers, a request later denied by the House Subcommittee on Health. The malpractice issue was not resolved until late in August, when Congress finally passed legislation indemnifying

all the vaccine producers and program participants from malpractice suits. Irresolution of this issue for two months and production of six million doses of vaccine by one manufacturer from the wrong virus strain further delayed the program's beginning until October 12, 1976.

Initially, the U.S. Public Health Service had planned for the program to begin in July with the immunization of high-risk populations using bivalent vaccine, followed by the immunization of the rest of the population with monovalent vaccine in September, but delays caused by the malpractice issue deferred this to October.

It was in this atmosphere of uncertainty that the program had to be planned between April and August. On June 21, 1976 the Public Health Service announced the results of vaccine field trials. Recommendations were made for vaccine use in the high-risk population and in the remainder of the population older than 18 years. Essentially, the recommendations were as follows:

Bivalent vaccine containing killed A/Victoria/75 and A/New Jersey/Swine/76 was to be given all individuals above 65 years of age and all individuals of any age suffering from any of the following chronic medical conditions: diabetes mellitus, chronic bronchopulmonary disease, congenital, rheumatic, coronary or hypertensive heart disease, chronic renal disease, and other chronic metabolic diseases; and the monovalent vaccine containing A/New Jersey/Swine/76 was to be given to all individuals 18 years and older not at high risk.

NEW YORK CITY PROGRAM DETAILS

The program was designed to be as flexible as possible in the event that it was decided to immunize the school-age population. The New York City program included the following essential elements: 90 new personnel, all university graduates, were hired and trained to use automatic jet injectors and to give cardiopulmonary resuscitation. Seventy-five sanitary inspectors and 150 public health nursing assistants were given similar training. Five hundred to 600 volunteers each day were recruited through the New York chapter of the American Red Cross. Forty-five swine influenza immunization clinics were established throughout the city, 20 in Department of Health facilities and 25 in the outpatient departments of hospitals. All these clinics were staffed by Department of Health personnel, using automatic jet injectors. Fifteen mobile teams, using automatic jet injectors, were established to inoculate 47,000 people in more than 200

nursing homes and about 100,000 people in 150 senior citizen centers. Vaccine was made available to private physicians in quantities of 100 doses of both types at a time and a cumulative total of 600 doses. Vaccine was made available to large group medical practices in quantities of 1,000 doses per request, with a cumulative total of 5,000 doses. Requests above these quantities had to receive special approval.

The department's 60 teams consisted of six persons, two vaccinators, a clinic supervisor, and three clerical and support personnel. Malpractice coverage was provided for all participants. A participant was defined in the federal legislation as any person, clinic, or facility, public or private, who administers the vaccine free of charge. The vaccine in all instances had to be given free. Private physicians could charge an administration fee if they so wished but by doing so lost federal malpractice coverage. All participants had to sign an informed consent to be retained for three years. All vaccine recipients received an information sheet, informing them of the advantages and risks of vaccination and possible side reactions. Telephone numbers were provided in each of the five boroughs for people to call in the event of severe reactions. All participants had to send in a tally by age of immunizations given to be forwarded daily and weekly to the Center for Disease Control (CDC). Because the vaccine was free at facilities operated by the Department of Health, Medicaid and Medicare providers could not charge for it, but were eligible to give the vaccine to their patients if they did so free of charge. All forms were printed in Chinese, Japanese, Italian, Yiddish, French, Spanish, and Greek. An extensive public health education program was undertaken, using radio, television, and local newspapers.

SURVEILLANCE FOR THE DISEASE AND VACCINE REACTIONS

The New York City Department of Health routinely conducts an influenza surveillance program as part of a national and international effort, which includes hospital surveillance, measurement of school absenteeism, isolation of the virus, examination of sera for anti-influenzal antibodies, and monitoring weekly reports of deaths due to pneumonia.

COST OF THE PROGRAM

The federal government allocated New York City 10 million doses of vaccine to immunize the entire population, but only those who were 18 years and older were immunized. In New York City this population

TABLE I. FEDERAL GRANT BUDGET, NEW YORK CITY
SWINE INFLUENZA IMMUNIZATION PROGRAM, 1976

Personnel	\$ 890,167
Fringe benefits	89,017
Travel	150,000
Equipment	9,000
Jet injectors	78,800
Supplies	150,000
Vaccine	<u>2,080,000</u>
Total	<u>\$3,446,984</u>

projected from the 1970 census was 5,926,059, and the city received about 4 million doses of vaccine, enough to reach less than 70% of this population. The vaccine cost 52 cents per dose, amounting to \$2,080,000. Eighty jet injectors cost \$78,800, supplies cost \$150,000, and personnel costs (90 people) were \$890,167. Table I shows that federal funds came to \$3,446,984 for immunizing the population over 18 years. Had the entire population been immunized, additional vaccine costs would have brought the total to \$6,606,984.

Because the amounts in the federal grant were originally calculated on the basis of 10 million vaccinations, administering only six million immunizations meant that the federal monies per dose for administration were increased to about 23 cents per dose.

Table II shows the direct costs to the Department of Health, most of it personnel costs. Ongoing programs had to be curtailed or suspended to conduct the program, and 225 people were assigned full time. Some 500 more gave varying periods of time to the program, at a cost included in the last item in Table II, and other indirect costs.

DISCUSSION

A mass immunization program such as the swine influenza immunization program conducted in a complex urban setting such as New York City is not difficult to plan, organize, and rapidly deliver, provided the appropriate strategies and tactics are employed. The New York City program was centrally operated, in contrast to most decentralized health programs today. Planning went smoothly from the outset because of representation from all segments of the health-care system. Consumer and community involvement was minimal because many initially hesitated to become

TABLE II. DIRECT COST OF THE SWINE INFLUENZA IMMUNIZATION PROGRAM TO THE NEW YORK CITY DEPARTMENT OF HEALTH, 1976

75 sanitarians*	225,000
150 public health nursing assistants†	405,000
Fringe benefits	73,000
Other indirect costs	300,000
Total	\$1,003,000

* Average salary \$1,000/month = \$3,000/3 months

† Average salary \$900/month = \$2,700/3 months

involved in the program. The debate about the significance of the swine flu, concern over reactions to the vaccine and the necessity for giving it, skepticism about the efficacy of the vaccine, and concern about malpractice liability generally made the private medical sector wary of participation early in the program.

The department's steering committee included three individuals who had worked in West Africa directing a mass immunization campaign against smallpox, measles, cholera, and yellow fever. They were a great asset.¹³⁻¹⁵ The American Red Cross recruited thousands of volunteers and maintained a Swine Flu Hotline telephone service for the general public and contributed enormously to the success of the program. Without their assistance, the Department of Health could not have delivered the program. The presence of 20 individuals in the department's immunization program who were knowledgeable in the use and repair of automatic jet injectors was an important asset because they trained many others to use jet injectors capable of delivering 1,000 immunizations per hour.

Had the malpractice issue not been resolved by federal legislation, it is unlikely that the program could have gone ahead. Prior to its resolution, hospitals hesitated to provide even space in their facilities for health department teams, from fear of possible liability in the event of suit.

The necessity of having each person to be vaccinated read a detailed informed consent form greatly curtailed the speed with which vaccinations could be delivered, but the greatest problems confronting the program were those which shaped public attitudes and made people refuse to be immunized. The program was plagued by problems from its inception in March 1976. Table III lists the chronology of major events affecting the program prior to its operational phase, which began in October 1976.

TABLE III. EVENTS AFFECTING THE SWINE INFLUENZA IMMUNIZATION PROGRAM PRIOR TO ITS COMMENCEMENT

<i>Date</i>	<i>Event</i>
January 1976	Outbreak of swine flu reported at Fort Dix, N.J. One recruit dies.
March 1976	Officials at CDC announce that U. S. faces possible swine flu epidemic in the fall. Virus is likened to the influenza virus of 1918.
March 24, 1976	President Ford announces a \$135 million program to immunize the entire population against swine flu. He acts on advice of officials of CDC.
April – May 1976	Four pharmaceutical companies begin production of swine-flu vaccines. Tests of these vaccines begun on 5,000 people. One company produces vaccine from an unacceptable strain of virus.
June 15, 1976	Vaccine manufacturers announce that they are losing liability insurance for swine-flu vaccines. Government officials request Congress to pass regulation to indemnify vaccine manufacturers. Request is denied by the House Subcommittee on Health.
June 21, 1976	Public Health Service officials announce results of field studies of swine flu vaccines. Vaccine is declared safe for those more than 24 years of age but not yet satisfactory for those below this age because of side effects. Further studies planned.
July 9, 1976	President Ford announces that the program will go ahead in spite of mounting opposition and doubts among experts and scientists.
July 13, 1976	Ford administration agrees to bear cost of defending law suits and requests Congress to pass legislation indemnifying the vaccine producers.
August 1976	Congress does not act on the president's request for liability legislation. The swine-flu program is at a standstill.
August 1976	Congress passes legislation indemnifying the vaccine producers and those administering swine-flu inoculations from malpractice.

There were always doubts in both scientific and lay circles as to the virulence of the swine flue virus, its epidemic potential, and the need for a mass-immunization program. On the basis of evidence presented in early 1976, the Center for Disease Control in Atlanta, Ga., proposed a nationwide immunization program strongly endorsed by a number of non-governmental scientists, including Dr. Albert Sabin and Dr. Jonas Salk. But as time went on, and no swine flu materialized during the winter season in the southern hemisphere, many began to doubt the need for a mass-immunization program. In November 1976 Dr. Albert Sabin, who had been rethinking his position, stated publicly that there was little possibility of a swine flu epidemic.¹⁶

The loss of liability insurance by the four vaccine manufacturers in June 1976 raised questions in the minds of ordinary citizens about the safety of the vaccines. The production of vaccine from a laboratory strain of swine influenza virus too weak to provide adequate protection magnified public concern about the vaccines. Congressional response to initial presidential requests for indemnification legislation was negative, which heightened public suspicions, even though reasons for congressional refusal to act had nothing to do with vaccine safety.

On June 21, 1976 results of the vaccine field trials were presented at a conference held at the Clinical Center of the National Institutes of Health. Studies showed that antibody responses were very poor in those less than 25 years of age and that reaction rates were unacceptably high in young people, especially children.

At this point the federal government could have shifted its commitment to a mass-immunization program and proceeded with one for the high-risk group only. Many public health officials at this point favored this approach, but the Center for Disease Control resisted this change. As the summer drew to an end with the liability issue unresolved, no immunization guidelines had been published for those less than 25 years of age. Aside from the difficulties in program planning and organization this posed for local public health officials, it led the general public to believe that swine flu vaccines were so untried that experts did not know how and if they could use them for the younger age groups. And if they were not safe for young people, how safe could they be for older people?

Congress finally passed legislation in August to provide government malpractice coverage to vaccine manufacturers and to those administering the vaccines, the first time the federal government assumed the role of medical malpractice insurer on such an enormous scale.

The New York City program began on October 12, 1976. The ceremonial opening of the program was held at 9 A.M. that morning at one of the department's 60 immunization stations. Turnout at all 60 stations was excellent that morning, but during the opening ceremonies, at which most of the New York City radio and television stations and newspapers were represented, the Associated Press and United Press International reported that three people were said to have died in Pittsburgh, Pa., following swine influenza immunizations.

Because New York City is where all the major radio and television stations are based, the local swine influenza program received intense scrutiny. By mid-day, several state health departments had suspended their immunization programs. But the decision of the New York City Department of Health was to continue the program. After an emergency meeting at mid-day, the staff of the Department of Health recommended continuing the program, even though the lot of bivalent vaccine being used was that alleged to have caused deaths in Pennsylvania. The department's staff could see no causal relation between three cardiac deaths in Pennsylvania and the swine influenza vaccine.

The department's executive staff knew that suspension of the program in New York City would receive more intense media and press coverage than in any other area of the country and was aware of what the national impact of this would be. During the decision-making process, the department's executive staff attempted to reach the Center for Disease Control in Atlanta to obtain more information and solicit advice. Numerous telephone calls went unanswered and we were not able to speak with anyone at the Center. Our colleagues across the country encountered the same problem. This led to variable local decisions. Nine states suspended the program, some states only suspended use of the vaccine lot in question, and some continued. Had the Center acted promptly and decisively, they might have forged a unified position across the country with state and local health departments.

Rubin summarized press coverage of the swine flu program and said the following of the October crisis: "Many reporters complained about the CDC's level of cooperation during the October crisis. They realized that phones were ringing off the hook, but when calls did get through, reporters said they were treated in a haughty manner."¹⁷ No comments were made by the Center on the issue until late in the day. By this time the hysteria which began at mid-day had mushroomed. Television, radio, and newspa-

pers were reporting on the mounting death toll. By the time the CDC came out with a statement, radio and television had been broadcasting the story for close to five hours and copy had been set for the next day's newspapers. Headlines in New York City newspapers the following day included: "The Scene at The Death Clinic" and "Death Toll Mounting."

After mid-day on October 12, 1976, the early morning turnout of people dwindled. The first morning some 15,000 people were immunized at the department's stations. In the succeeding weeks this fell to an average of 5,000 per day. After a week, media and press interest in the alleged deaths dwindled, when no correlation was demonstrated between them and the vaccine. Other deaths occurred, especially among the elderly with chronic cardiac disease, when other lots of vaccine were used. Although the consensus was that the deaths were not related to the vaccine, many among the general public had their doubts.

Other adverse events during October lessened public confidence in the vaccine. On October 23, 1976 recommendations were made to immunize the three-to-18-year-old age group. The recommendation of two inoculations four weeks apart was impractical, given the already complex bureaucratic processes and paper work surrounding each inoculation, and national advisory bodies making this decision decided that split virus monovalent vaccine was to be used in healthy youngsters three to 18 years of age and whole virus monovalent vaccine in those 18 to 24 years. Whole virus bivalent vaccine was used in those over 65 years and high-risk individuals 25 to 65, but split virus bivalent vaccine was recommended for high-risk individuals three to 18 years. In effect, then, the program administered four vaccines to different age groups, two of whom required a booster after four weeks. Logistically, it was virtually impossible to implement so complex a protocol in a mass-immunization program designed for millions within eight weeks and already weighted down by inordinate bureaucratic red tape. Because these recommendations were viewed as impractical and because of professional differences of opinion, state and city health departments formulated different plans.

In November 1976 the New York City Department of Health convened an Ad Hoc Expert Advisory Committee to advise the task force on swine influenza immunizations for children three to 18 years. This committee of 10 consisted of the directors of pediatric services at the city's leading university hospitals. In view of the poor antibody responses, the significant level of side reactions, and the fact that the flu season was already well

TABLE IV. EVENTS AFFECTING THE OUTCOME OF THE SWINE INFLUENZA IMMUNIZATION PROGRAM AFTER ITS COMMENCEMENT

<i>Date</i>	<i>Event</i>
October 12, 1976	New York City program begins. Three persons alleged to have died in Pittsburgh from swine influenza inoculations. Nine states suspend the program. The New York City Department of Health chooses to continue the program.
October 13, 1976	Sharp fall in attendance at New York City clinics. Intense media and press coverage of deaths in Pittsburgh.
October 14, 1976	Program resumed in some states after epidemiologic investigations and tests of vaccine lots exonerate vaccine as cause of deaths. President Ford and his family receive inoculations.
October 15, 1976	In spite of assurances about vaccine safety from CDC, few turn out for inoculations.
October 18, 1976	Press carries stories that swine-influenza vaccines lack neuraminidase enzyme necessary for antibody production.
October 20, 1976	Press continues to carry stories tallying up "deaths due to swine-flu vaccine."
October 23, 1976	Federal officials recommend two doses four weeks apart for high-risk children three to 18 years. No recommendations given for healthy children in this age group.
October 25, 1976	<i>The New York Post</i> and <i>Time</i> magazine report that alleged mobster Carlo Gambino had died after a swine-flu shot.
November 17, 1976	Ad Hoc Expert Advisory Committee on Immunizations for Healthy Children convened by New York City Department of Health. Committee recommends against immunization of healthy children.

(Continued)

TABLE IV(Continued)

<i>Date</i>	<i>Event</i>
November 19, 1976	New York City Department of Health survey reveals that 83.9% of interviewees had not received and did not intend to receive swine-flu shots.
November 23, 1976	Nonfatal case of swine flu reported in Missouri. One-day rise in attendance at New York City clinics. Swine flu appears as a mild disease. Some 20 million inoculations given to date in the United States.
November 27, 1976	Press reports possible death of a man in New Jersey due to a swine-flu shot.
December 8, 1976	Swine-flu virus isolated in Wisconsin pig farmer. Disease confirmed as mild. Assertions of opponents of program that swine-flu virus is present constantly and periodically transmitted to man from pigs are strengthened.
December 14, 1976	Guillain-Barré paralysis reported linked to swine flu inoculations.
December 16, 1976	National swine flu program suspended because of concern that shots were linked to 94 cases of Guillain-Barré syndrome in 14 states.
January 15, 1977	Advisory Committee on Immunization Practices of Public Health Service recommends resumption of swine-flu program. The New York City Department of Health opts not to resume program fully but to make vaccine available to hospitals and private physicians. Five clinics opened in each of five city boroughs. Attendance at each runs about four persons per day.

underway with no swine flu in sight, this committee recommended that healthy children in this age group not be immunized unless an epidemic occurred. This became the policy of the New York City Department of Health, one that diverged from that recommended by CDC.

On November 23, 1976 a nonfatal case of swine flu was reported in Missouri. The immediate result of this report was a dramatic rise in the daily number of immunizations in New York City. The number of daily immunizations rose from 5,000 to 12,000, but as soon as it became apparent that the disease was mild and that it did not spread to others, attendance fell once again. On December 8, 1976 swine flu virus was isolated from the nasopharyngeal washings of a Wisconsin pig farmer. This had no effect on the numbers immunized because by this time it was commonly accepted by the public that swine flu was mild, it was always around in different places, and it spread occasionally from pigs to man. The threat of swine flu was more and more seen as being very remote.

By mid-November, less than 5% of the New York City target population had been immunized. Widespread availability of the vaccine and the convenient location of the department's 60 clinics, many of which saw few people each day, indicated that most did not wish to be immunized.

To ascertain more precise data on public attitudes toward the program, a one-week interview survey was conducted in two distinct areas of the city to assess the attitudes of middle-class commuters and those in poverty areas. To ascertain attitudes among the former, interviews were conducted on Wall Street and in Grand Central Station. To ascertain attitudes among poor black and hispanic populations, interviews were conducted in the Bedford-Stuyvesant area of Brooklyn. This survey is summarised in Table V. Of the 436 people interviewed, only 70 (16.1%) said they had received swine flu shots; 233 (53.4%) had not and did not intend to. Of these, 51.5% thought the inoculation was unnecessary, 33.5% were afraid to get it, 12.8% had been advised by their physicians not to get it, and 2.2% had no reason.

Table V shows that most middle-class commuters did not consider swine influenza immunizations necessary. Only a minority were afraid to get it. Among the inner city group, fears of the vaccine were considerably greater, but most thought immunization unnecessary.

On November 27, 1976 CDC, concerned by poor turnout across the nation, especially in the larger cities, stated that programs in large cities were failing to reach black and other minority populations, a statement that

TABLE V. ATTITUDES TOWARD SWINE INFLUENZA IMMUNIZATIONS, NEW YORK CITY, NOVEMBER, 1976

Area of city	Not necessary		Afraid to be immunized		Physician advised against it		Reason for not being immunized		Total No.
	No.	%	No.	%	No.	%	No.	%	
Commuter	35	61.3	11	19.3	10	17.5	1	1.9	57
Inner-city	85	48.2	67	38.1	20	11.3	4	2.4	176
Total	120	51.5	78	33.5	30	12.8	5	2.2	233

TABLE VI. SWINE INFLUENZA IMMUNIZATIONS, NEW YORK CITY, 1976-1977

	Private organizations*		Health department		Private physicians		Totals					
	Mono-valent	Bi-valent	Mono-valent	Bi-valent	Mono-valent	Bi-valent	Mono-valent	Bi-valent				
Doses administered	160,529	48,562	209,091	155,212	118,745	273,597	41,267	114,829	156,046	357,008	282,136	639,144
Doses distributed	672,180	268,670	940,850	437,000	600,050	1,037,050	71,170	148,060	219,230	1,180,350	1,016,780	2,197,130

*Includes nursing homes, industrial organizations, commercial organizations, hospitals, and unions.

TABLE VII. SWINE-INFLUENZA IMMUNIZATIONS AND ADVERSE REACTIONS, NEW YORK CITY, 1976-1977

<i>Borough</i>	<i>Number of immunizations</i>	<i>Number of reported adverse reactions</i>	<i>Reactions \times 1,000 immunizations</i>
Manhattan	337,998	609	1.8
Bronx	63,879	336	5.3
Brooklyn	90,105	623	6.9
Queens	126,955	666	5.2
Richmond	20,207	123	6.1
Total	639,144	2,357	3.7

erroneously presumed that the black population wanted immunization. The New York City Department of Health swiftly cited the results of its survey and pointed out that of all the populations in the city, the poor had best access to the department's swine flu clinics because the department's health centers were all built in the 1930s and 1940s in areas which have subsequently become "inner-city poverty areas." Most of the department's swine-flu clinics were located in these centers.

Shortly after the department's survey, one was undertaken by *The New York News*, one of the city's two leading newspapers. Among 504 people interviewed, results were similar to those obtained by the Department of Health survey. Clearly most people did not intend to be immunized.

On December 14, 1976 CDC reported a number of cases of Guillain-Barré paralysis among individuals after receiving swine influenza immunizations. On December 16, 1976 the program was suspended throughout the United States. The Guillain-Barré syndrome is known to occur after immunizations and a certain incidence was expected after swine-influenza immunizations. Because of intense surveillance of vaccines for all kinds of side reactions and the litigious atmosphere surrounding the swine-flu program, these cases surfaced very quickly. At the time the program was suspended, 40 million (17%) of the national target population had been immunized.

On January 15, 1977 the Public Health Service Expert Advisory Committee on Immunization Practices recommended partial resumption of the program for the high-risk population. In New York City the Department of Health again made the vaccine available to private physicians, clinics, and hospitals, and opened an immunization clinic in each of the city's five boroughs. No other elements of the program were reinstated.

TABLE VIII. SWINE-INFLUENZA IMMUNIZATIONS BY AGE GROUP, NEW YORK CITY, 1976-1977

<i>Age groups</i>	<i>Total doses administered</i>		<i>Total</i>
	<i>Monovalent</i>	<i>Bivalent</i>	
5	0	69	69
5 - 17	745	3,279	4,024
18 - 24	50,558	6,499	57,057
25 - 44	165,926	30,934	196,860
45 - 64	134,019	71,727	205,746
65+	10,470	164,918	175,388
Total	361,718	277,426	639,144

Less than half a dozen people showed up each day at each of the five clinics.

Tables VI, VII, and VIII present the results of the swine-influenza immunization program in New York City. A total of 639,144 doses were actually administered. There were 2,357 untoward reactions, a ratio of 3.7 per 1,000. A total of 2,197,130 doses of vaccine were distributed to the three principal groups of providers (Table VI), but slightly more than a quarter of these were actually administered. These results were far below the targets established at the inception of the program, but reflected the public's perception of the need for immunization. Table VIII presents the immunizations by age group and type of vaccine administered. Most immunizations were given in the 25-to-44 and 45-to-64-year age groups.

SUMMARY

New York City's swine-influenza immunization program was the largest single program in the United States and the largest immunization program ever planned and implemented in the city's history. Although results of the program were far below those originally intended, the program itself afforded the New York City Department of Health the opportunity of planning, organizing, and implementing a complex immunization effort of great magnitude in a short time. It was demonstrated that this can be done in a complex urban environment such as New York City. New York City's program was beset by all of the controversies and problems which occurred nationally, but because of the concentration of mass media and press networks in the city, the New York City program had to deal in public on an almost daily basis with these problems and controversies.

Clearly, public compliance with a mass-immunization effort does not follow the recommendations of public health agencies. Most New Yorkers were not immunized because they saw no need for it. An important lesson for the future is that mass-immunization programs will not be successful unless the public perceives a need to be immunized.

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