The 1947 Smallpox Vaccination Campaign in New York City, Revisited

To the Editor: In 1947, millions of New Yorkers received smallpox vaccinations, an accomplishment still appropriately held up as an example of public health planning and mobilization. Although now mythological, a review of the events of April 1947, from copies of The New York Times (1–9), tells of a more recognizably human response: pushing, jawing, deceit, shortages, surpluses, and perhaps a unusual way of counting vaccinees.

In March 1947, a patient who had recently visited Mexico traveled by bus to New York City. He became ill, was hospitalized, and, after his death, found to have had smallpox. The occasional case of smallpox had been seen in the area for decades since the last big outbreak in 1875, which had killed 2,000 New Yorkers. However, in 1947, a second case and then a third appeared, and authorities became concerned. On April 4, Israel Weinstein, the New York City Health Commissioner, urged all New Yorkers who might have been exposed to the disease to receive the vaccine. Then he urged all 7.8 million New York residents to receive the vaccine. The city swiftly rolled up his sleeve and was vaccinated. Free vaccine clinics were established throughout the city, and doses were given to private physicians for administration. During the first week, surprisingly little public attention was captured (Times articles typically were brief and confined to page 21). The story hit page 1 on April 13 (3), after a second person died from the disease. Mayor William O’Dwyer urged all 7.8 million New York residents to receive the vaccine. Then he rolled up his sleeve and was vaccinated by Dr. Weinstein. The city swiftly swung into full crisis mode. Police, fire, and health departments and hospitals were mobilized to provide additional space for the effort.

Two days later, epidemiologic investigation indicated that all patients with diagnosed cases were related and that, in all likelihood, the outbreak had been successfully halted through tracing the movements of the various patients and vaccinating anyone who had contact with them, so-called “ring” vaccination (4). Despite this halt of the outbreak, the city pushed forward. The campaign to “Be sure, be safe, get vaccinated!” had proven successful. By city estimate, >600,000 persons had received vaccine in the first week.

Vaccine side effects, which dominated coverage of today’s vaccination program, were seldom discussed in 1947. Dr. Weinstein assured residents, “Vaccination is painless. The skin is not even broken by the needle. Sometimes a soreness develops in the armpit. If the arm becomes very sore, apply an icebag” (4). This advice is simple compared to the depth and breadth of information given today to a potential vaccinee. Now, volunteers are given several informational lectures and a protracted individual interview to discuss lingering questions, and they are required to sign a document confirming adequate comprehension and acceptance of the risks.

In the 1947 campaign, trouble began on April 16, when (no longer on page 1), the Times announced, “Vaccinations Stop; Drug Supply Gone; Thousands Turned Away” (5). With little warning, and at the height of the program, the vaccine supply vanished, something that was never explained. After spending days wearing up citizens to receive the vaccine quickly, the mayor and Dr. Weinstein now had to downplay the urgency of receiving vaccination. They assured New Yorkers that a delay of a few days or more represented “no health hazard” (5).

Of the 1.2 million doses distributed by April 16, 1947, 42,000 had been supplied by private laboratories, far short of the promised number. In contrast, the Army and Navy had given almost 800,000 doses, and the city’s public health laboratories had made the remaining 400,000.

During the shortage, the Times noted, “hundreds of eager men, women, and children queued up at Bellevue Hospital at dawn, although vaccinations were not scheduled to begin until 10 a.m. At some stations, the crowds did not take kindly to the news that the doctors had run out of vaccine and the police had a little difficulty dispersing a crowd of several hundred” outside one vaccine station (5).

On April 17, the situation brightened, when more than a million doses suddenly arrived from private laboratories, and 500,000 persons were vaccinated (6). As the crisis slowly lessened, doctors were recruited at US$8 (US$64 in today’s market) for a 3-hour session (or US$24 for all day; US$192 in today’s market) to administer vaccine, but few volunteered. Public health authorities in Westchester County chided local physicians for charging $35 per vaccine (7), and a 29-year-old woman, dressed up as a nurse, vaccinated 500 people with water to impress her “man companion” until she was sent to the Bellevue psychiatric ward for evaluation (8).

Continued complaints about side effects were dismissed by Dr. Weinstein, who again advised those whose arm ached that they only needed to place an icebag in the armpit for relief. Within a week, the program had wound down and been proclaimed “a miracle” (2) by all involved.

The claim of 5 or 6 million vaccinations administered cannot be reconciled against the daily tally reported in the Times. If one assumes that day-to-day numbers reported in the newspaper were roughly accurate, a simple calculation places the number of vaccinees closer to 2.5 million, far short of the announced total. For example, on April 21, a grand total of 3.45 mil-
milion recipients were reported; the next
day, after noting that only 200,000
additional persons had received vac-
cine, the total swelled to 4.4 million
(9).

These data reflect the difficulties
intrinsic to managing such a massive
program. The discrepancy may sim-
ply be a case of not adding columns of
numbers in a systematic way; howev-
er, the fuzzy numbers do have a cer-
tain appeal to the modern, more cyni-
cal reader.

Whatever occurred, understanding
the specifics of “the great vaccination
miracle” of 1947 is important for
maintaining equilibrium during our
current smallpox vaccination program
and any future programs directed at
now-anticipated infections. Not
just New York City’s, but the entire
country’s sense of confidence that it
can handle a major rapid vaccination
or pill distribution campaign leans
very heavily on the apocryphal vac-
cine campaign of April 1947. Yet, as
described above, there may be much
less to the miracle than meets the eye.

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References

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2. Curb of smallpox a ‘miracle,’ says city
3. Second smallpox death spurs vaccination.
4. One more smallpox case found; lone source
5. Vaccinations stop; drug supply gone. The
6. Smallpox scare soon dissipated. The New
7. Physicians chided on smallpox aid. The
8. Half million were vaccinated in day. The
9. Physicians explain vaccination reaction,
Weinstein urges all to be immunized. The

Smallpox
Vaccination and
Adverse Cardiac
Events

To the Editor: The incidence of
adverse cardiac events related to
smallpox vaccinations administered
during the National Smallpox
Vaccination Program (NSVP) in 2003
has received widespread attention.
From January 24 through August 8,
2003, suspected or probable myo-
or pericarditis was reported in 22
of 38,257 civilian vaccinees (1); as of
November 4, 2003, suspected or prob-
able myo- or pericarditis was reported
in 63 of 515,000 military vaccinees
(2). Additionally, cases of coronary
artery disease, including myocardial
infarction and cardiac death, were
reported in the weeks after vaccina-
tion although no causal link has been
established.

An October 3, 2003, MMWR arti-
cle, “Cardiac deaths after a mass
smallpox vaccination campaign—
New York City, 1947” states that the
NYC experience suggests “…that car-
diac deaths observed in 2003 might
have been unrelated to smallpox vac-
cination.” While the causes of these
cardiac or coronary deaths have not
been established, the 1947 data lack
the power to address whether there is
a relationship to the vaccine.

Cardiac or coronary deaths after
vaccination in 2003 were rare, with a
total of 3 of 488,550 military and
civilian vaccinees (6 per 1 million
vaccinees), approximately the same as
might be expected in a generally
healthy population. The total number
of cardiac or coronary deaths in 1947
during the 2-week estimated risk peri-
od after vaccination was 1,545. While
the denominator (number vaccinated
in the previous 4–17 days) was not
reported, a total of 6.4 million persons
were vaccinated during the 4 weeks of
the vaccination program. The 4-week
vaccination period would result in a 6-
week period of susceptibility for car-
diac death according to the 4–17 day
latency period. Thus, we extrapolate
that the denominator for the 2-week
observation period is approximately
2.1 to 6.4 million vaccinees at risk
during the study period. This would
mean that approximately 240 to 720
cardiac deaths occurred per million
vaccinees.

Suppose that the 1947 smallpox
vaccine indeed caused serious cardiac
disease, including myopericarditis
and myocardial infarctions, with 10
fatal cases per million. Viewed in per-
spective, this would approximate the
historic rate of vaccine-induced
encephalitis and would be well in
excess of the historic rate of progres-
sive vaccinia. In this scenario, at a
hypothetical incidence of 10 per mil-
lion, from 21 to 64 of the 1,545 car-
diac deaths (1.4% to 4.1%, respective-
ly) would have been caused by the
vaccine. This magnitude of effect
would have been very difficult to
detect in this study. Thus, the results
of such investigations must be consid-
ered in the context of power limita-
tions. Further, studying death rates
sheds no light on cardiac illness such
as myo- or pericarditis.

The proper interpretation of these
data is important given the national
policy impact that resulted from the
observation of cardiac and coronary
illness and death after vaccination in
2003. At this time, adverse cardiac
events associated with the vaccine,
particularly myo- or pericarditis, are
still of concern. Whether coronary or
cardiac deaths can be attributed to the
vaccine remains an open question.

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