A Vaccination Scar
The Cutter Incident and Medical Mistrust in America

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Vaccine Hesitancy & Covid-19

Source: Our World in Data (July 10th, 2021)
The Cutter Incident

In 1955, Cutter Laboratories failed to inactivate the poliovirus in some lots of vaccine, inadvertently injecting thousands of children live poliovirus

"[The Cutter Incident] was one of the worst biological disasters in American history, exploded the myth of the invulnerability of science and destroyed faith in the vaccine enterprise." - Offit (2005)
A Brief History of Poliomyelitis

Disease caused by the poliovirus, which spreads from person to person and can infect a person’s spinal cord.
A Brief History of Poliomyelitis

Polio by Year from Our World in Data

“There were three little hearses before the door; all her children had been swept away.”

SALK POLIO VACCINE PROVES SUCCESS; MILLIONS WILL BE IMMUNIZED SOON; CITY SCHOOLS BEGIN SHOTS APRIL 25

TRIAL DATA GIVEN
Efficacy of 80 to 90%
Shown—Salk Sees Further Advance

Abstract of report, summary of data on tests, Page 22.

By WILLIAM L. LAURENCE
Special to The New York Times.
ANN ARBOR, Mich., April 12
The world learned today that its hopes for finding an effective weapon against paralytic polio had been realized.

New York Times, April 13th, 1955
Reports of Polio Appear in Vaccinated Individuals

Times Union, May 9th, 1955
Note: Example from the May 11, 1955 Poliomyelitis Surveillance Report
Location of Cutter Cases

Note: Data collected from Poliomyelitis Surveillance Reports (1955)
Outcomes & Methods

**Two geographic levels:** $\rightarrow r$
- county & state

**Four frequencies:** $\rightarrow t$
- month, quarter, year, survey wave

**Three sets of outcomes:** $\rightarrow \text{outcome}_{rt}$
- immediate impacts, medium-long-run impacts, response to other health shocks

**One treatment:** $\rightarrow \text{Cutter}_r$
- indicator $= 1$ if the region had at least one case of polio among an individual vaccinated by vaccine manufactured by Cutter Laboratories
Outcomes & Methods

Event Study:

\[
\text{outcome}_{rt} = \alpha + \sum_{t=-T, t\neq -1}^{T} \phi_t [\text{Cutter}_r \times \text{Time}_t] + \gamma_r + \delta_t + \epsilon_{rt} \tag{1}
\]

Random Assignment:

\[
\text{outcome}_{rt} = \alpha + \beta \text{Cutter}_r + \gamma \text{population}_{rt} + \delta_t + \epsilon_{rt} \tag{2}
\]
Fraction of people with children who say they have vaccinated or plan to vaccinate their children before and after vaccinations were suspended.
Event Study Estimates of Polio Cases

Coefficient estimates and 95% confidence intervals from the event study. The dependent variable is the # of acute polio cases per 100,000 people. Controls: state fixed effects, state linear trends, quarter-year fixed effects. Standard errors clustered by state.
## Table: Vaccine-Preventable Mortality 1968-1978

<table>
<thead>
<tr>
<th></th>
<th>MMR &lt;5 (1)</th>
<th>DPT &lt;5 (2)</th>
<th>Flu &lt;5 (3)</th>
<th>Flu &gt;65 (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutter Incident</td>
<td>0.0860</td>
<td>0.0209</td>
<td>0.189***</td>
<td>0.0626***</td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
<td>(0.034)</td>
<td>(0.049)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Population</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>State F.E.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>N. Obs</td>
<td>3067</td>
<td>3067</td>
<td>3067</td>
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<tr>
<td>Clusters</td>
<td>48</td>
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Notes: The dependent variable in each specification is an indicator that equals 1 if the county reported at least one death from the specified disease over the 1968-1978 time period. Treatment varies by county in all specifications. Standard errors clustered by state in parentheses.  
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
## Table: Vaccine-Preventable Communicable Diseases 1996-1998

<table>
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<tr>
<th></th>
<th>MMRP (1)</th>
<th>STIs (2)</th>
<th>AIDS (3)</th>
<th>Lyme (4)</th>
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<tr>
<td>Cutter Incident</td>
<td>0.181**</td>
<td>0.0495</td>
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Notes: The dependent variable in each specification is an indicator that equals 1 if the state reports at least one case of the specified disease in a given month. Treatment varies by state. Standard errors clustered by state in parentheses. * \( p < 0.10 \), ** \( p < 0.05 \), *** \( p < 0.01 \)
## Communicable Diseases

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Coefficient estimates and 95% confidence intervals from the event study. The dependent variable equals 1 if the county had a death from measles. Controls: county fixed effects, year fixed effects, population. Standard errors clustered by county.
Conclusion

Non-trivial change in health outcomes following the Cutter Incident

- The Cutter Incident may have some explanatory power for contemporary vaccine hesitancy
- Cautionary tale when compared to recent events, like the Johnson & Johnson and Astra Zeneca vaccine-pauses

Contribution to the persistence of health shocks and individual behavior

- Alsan and Wanamaker, 2018; Archibong and Annan, 2021; Lowes and Montero, 2020; Martinez-Bravo and Stegmann, 2021