

## **Disclosures**

The speaker discloses he is not a historian, but rather an amateur with an interest.

This presentation represents the opinions of the speaker and does not represent any official positions of the Massachusetts Department of Public Health, other organizations with which the speaker is affiliated.



# Epidemics of Smallpox in Pre-Colonial and Colonial Massachusetts

## **Pre-Colonial**

- **❖** Infectious diseases introduced by Europeans killed large numbers of native peoples prior to the arrival of the Pilgrims
- **❖** Smallpox epidemics of 1617-19
- **❖** In 1619, Captain Derner reports deserted villages, with a few sick people remaining
- **❖** Epidemic in 1633-34 estimated to have killed 1/3 to 1/2 of all surviving natives of Massachusetts

<b>*</b> 1617-19	<b>*</b> 1702
<b>*</b> 1633	<b>*</b> 1721-22
<b>*1648</b>	<b>*1731</b>
<b>*1666</b>	<b>*1751</b>
<b>*</b> 1677	<b>*</b> 1755-56
<b>*</b> 1689	<b>*1764</b>
<b>*</b> 1692	<b>*</b> 1775

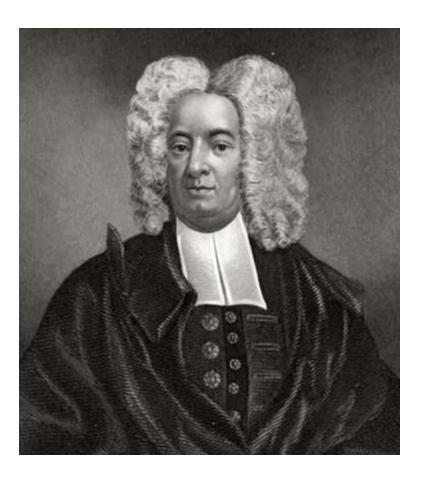
❖Leading to frequent moves of the Great and General Court❖Enactment of isolation and quarantine laws

## Smallpox, Massachusetts, 1721

- \*On April 22, 1721, the passenger ship *HMS Seahorse* arrived at Boston from Barbados and cases of smallpox emerged while the ship was in quarantine at Spectacle Island and spread to the city
- **❖**Widespread transmission started by the end of May
- **Control** efforts were inadequate
- **❖In June, Cotton Mather, pastor of the Second Church, proposes inoculation to control smallpox**



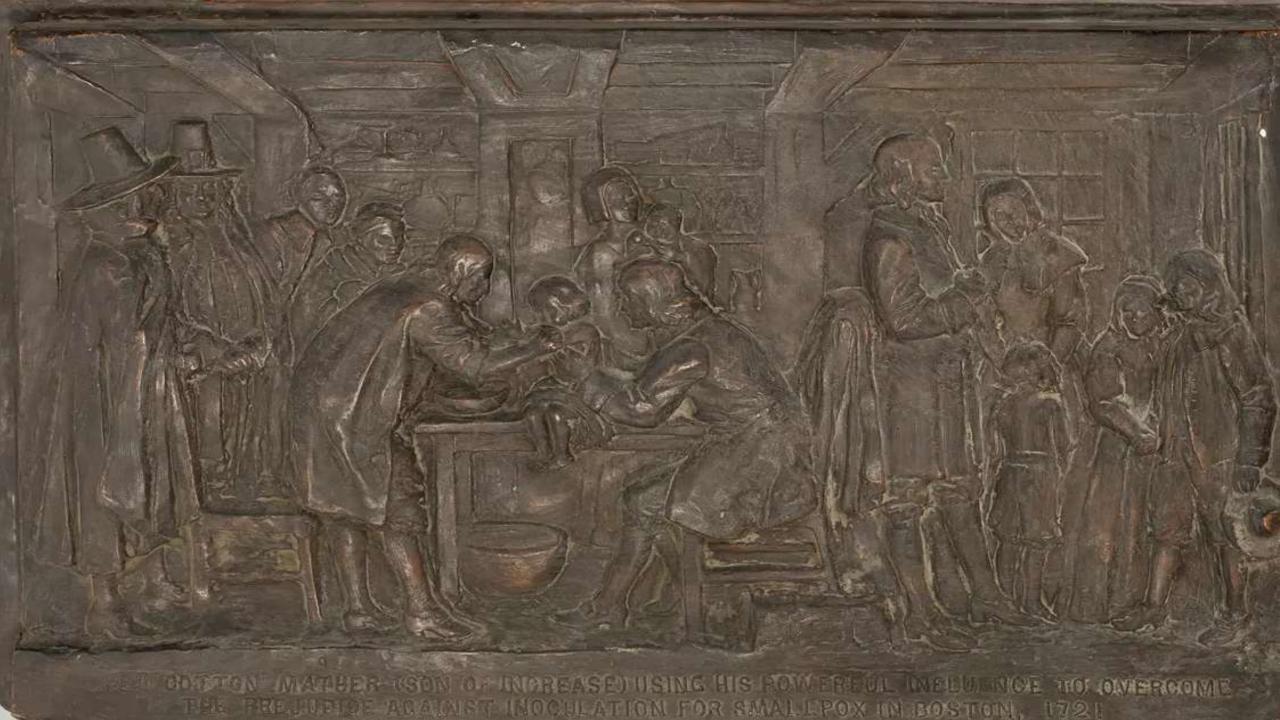
## Cotton Mather and Smallpox Inoculation



- \*Prior to 1716, Mather had asked his enslaved servant, Onesimus whether he had smallpox: "he answered, both yes and no; and then told me that he had undergone an operation, which had given him something of the smallpox and would forever preserve him from it; adding that it was often used among the Guramantese"
- \*He read Timonius' paper on inoculation published in the Philosophical Transactions of the Royal Society in 1716
- **❖In June 1721, Mather informs Boston physicians about inoculation, only Zabdiel Boylston uses the technique**
- **❖**Rest of medical profession and the establishment are against inoculation

## **Huge Controversy Ensues**

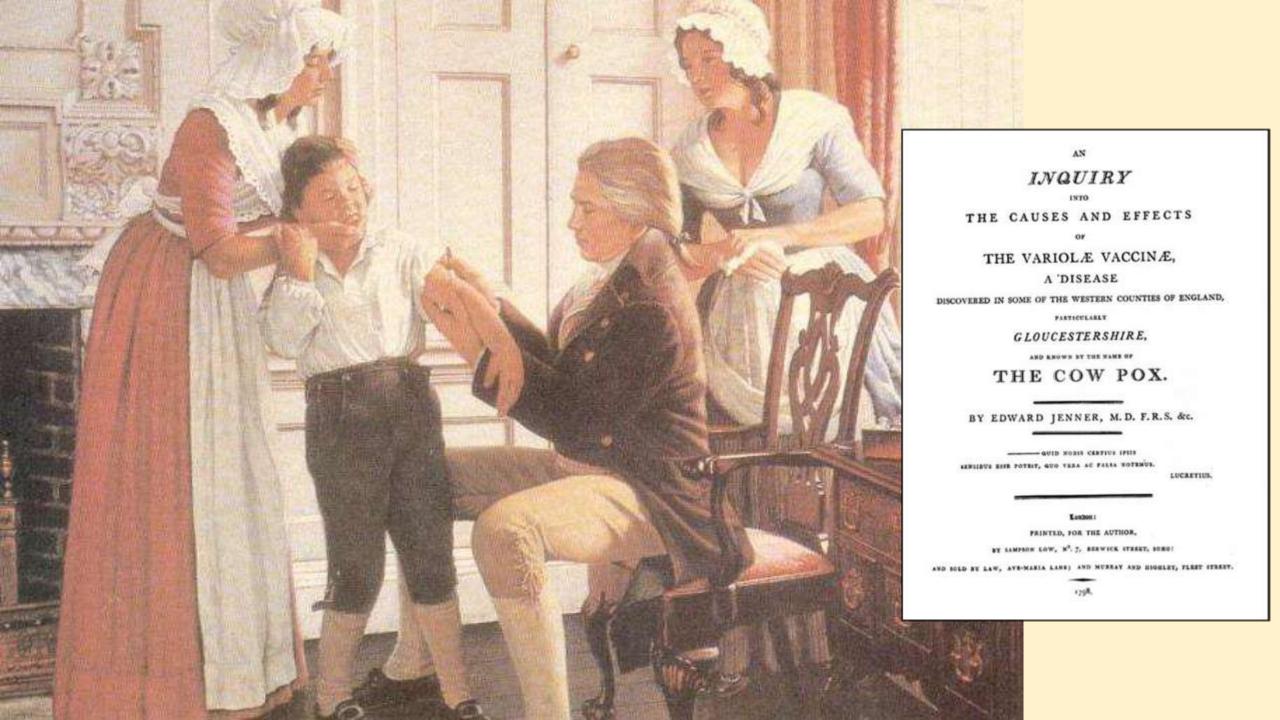
- **❖New England Courant (James Franklin, editor) publishes multiple articles attacking inoculation, Boylston and Mather**
- **❖Dr.** William Douglass publishes *The Abuses and Scandals of Some Late Pamphlets in Favour of Inoculation of the Small Pox* attacking the credentials of inoculation supporters
- \*Religious opposition based on thwarting God's will
- **❖Boston selectmen pass ordinance against inoculation**
- \*In November, grenade thrown in Mather's house, with a note: "Cotton Mather, you dog, damn you! I'll inoculate you with this, with a pox to you!"

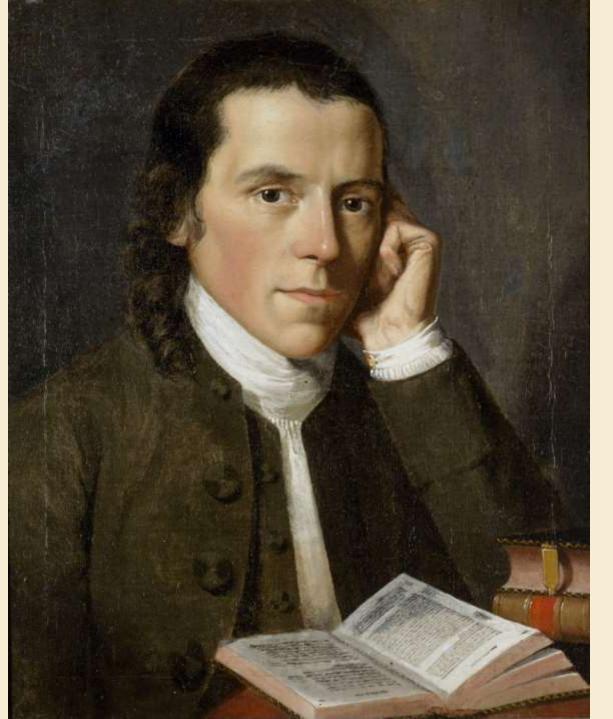


# Smallpox and the Revolutionary War

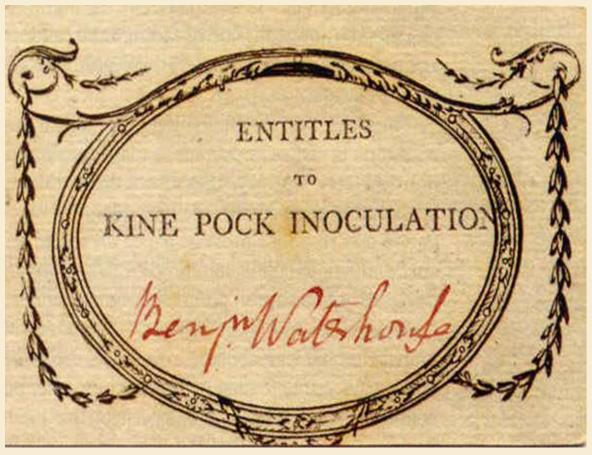
"Our misfortunes in Canada are enough to melt a heart of stone. The small-pox is ten times more terrible than Britons, Canadians, and Indians together. This was the cause of our precipitate retreat from Quebeck [sic]; this is the cause of our disgraces at the Cedars." - John Adams to Abigail Adams, June 26, 1776

"Finding the smallpox to be spreading much and fearing that no precaution can prevent it from running thro' the whole of our Army, I have determined that the Troops shall be inoculated. This Expedient may be attended with some inconveniences and some disadvantages, but yet I trust, in its consequences will have the most happy effects." - George Washington to William Shippen, February 6, 1777





## 

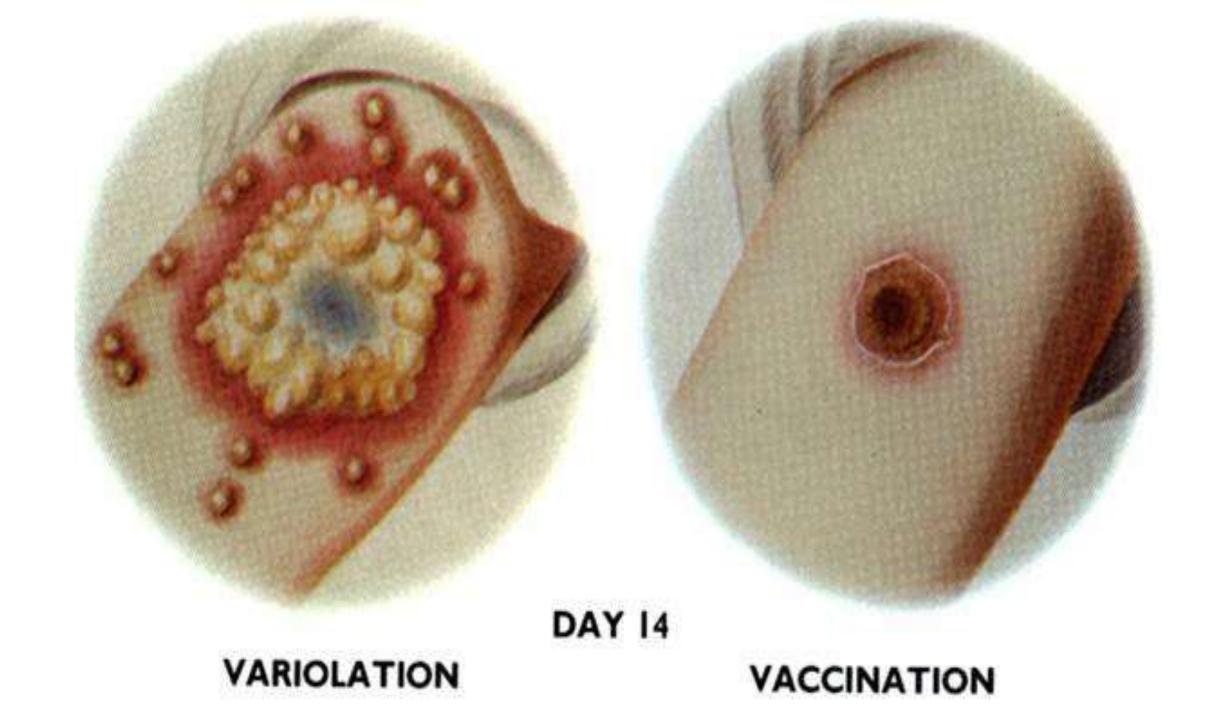


"This is no sham. As a man of humanity I rejoice in it though it will take from me a handsome annual income."

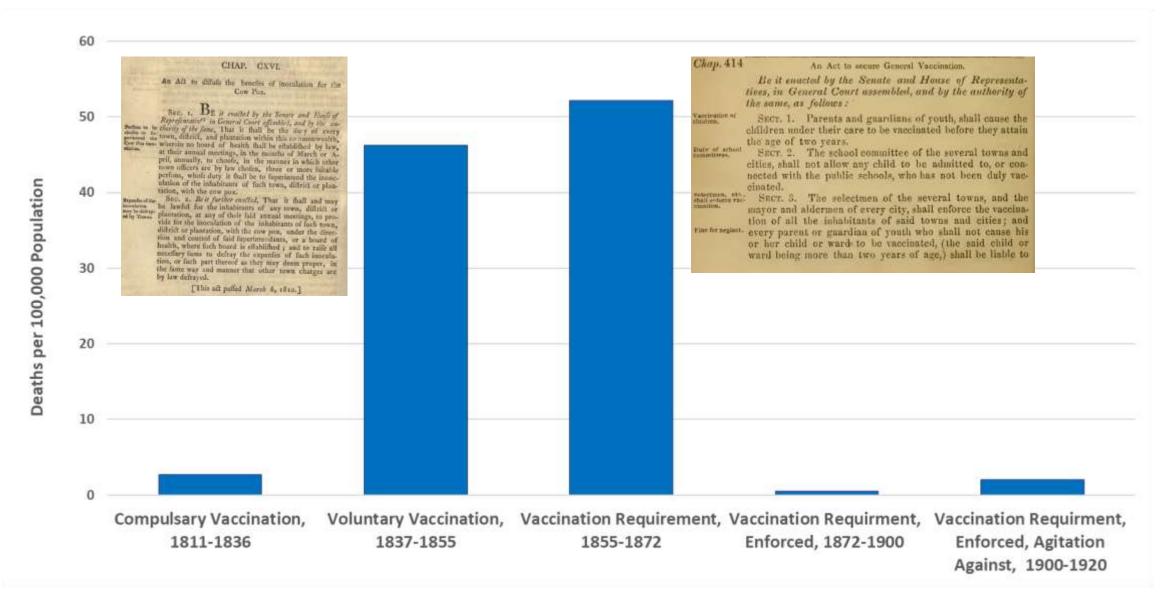
William Aspinwall, Proprietor of the Brookline Inoculation Hospital, 1800

"Every friend of humanity must look with pleasure on this discovery, by which one evil more is withdrawn from the condition of man; and must contemplate the possibility that future improvements and discoveries may still more and more lessen the catalogue of evils"

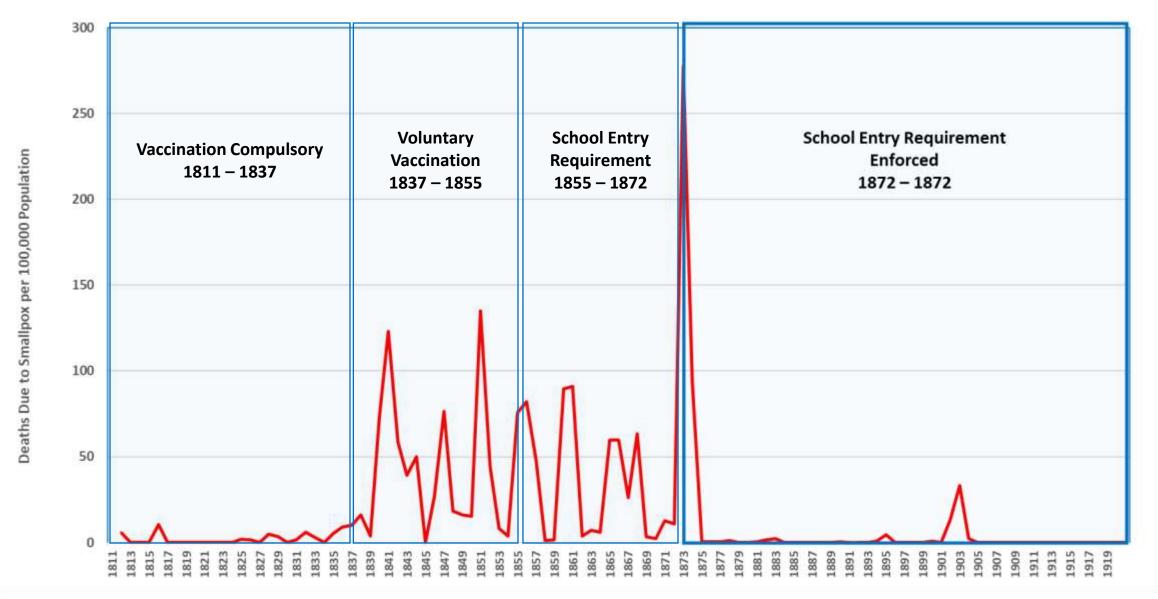
Thomas Jefferson on Smallpox Vaccination, 1800



# Deaths Due to Smallpox per 100,000 in Boston for Periods of Vaccination Requirement and Enforcement



# Deaths in Boston Due to Smallpox per 100,000 Population, 1811 to 1920 Rate in 1721 Boston was 7,730 per 100,000

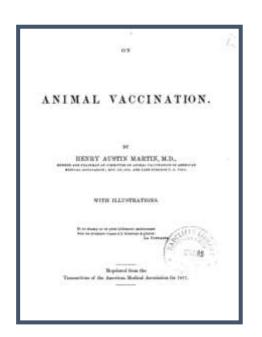




## Henry Austin Martin (1824-1884)

- Boston physician
- **\*** Chair of the AMA Vaccination Committee
- **❖ Introduced calf lymph vaccine production** to America in 1870
- **❖ Produced vaccine in a barn in back of his house in Roxbury**
- **❖** Product used widely in the epidemic of 1873
- **❖** Major influence on the acceptance of calf lymph vaccine in the U.S

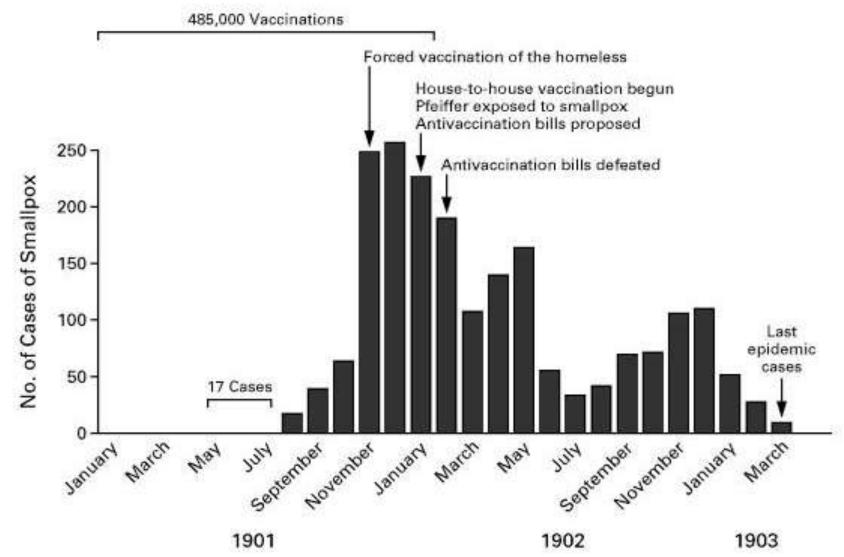
Source: John Buder







# Distribution of Smallpox Cases in Boston during the Epidemic of 1901 through 1903

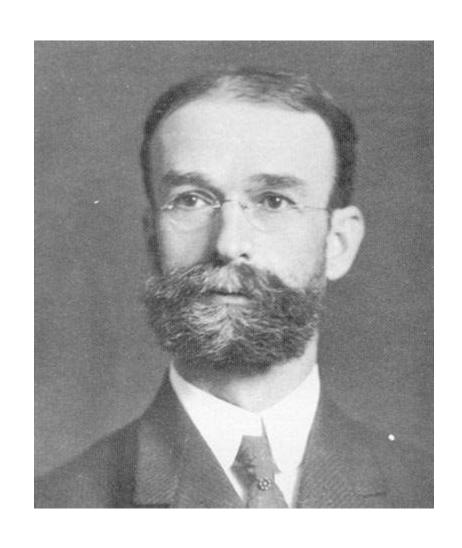






## Theobald Smith, 1905

(Director of the Massachusetts Biologic Laboratories)



"....the production of animal vaccine by the State is a logical necessity. Furthermore, it is the only way to bring the physician who performs vaccination in close touch with the producing laboratory."



## FOUR PROSECUTIONS BY BOARD OF HEALTH.

Judge McDaniel Imposes a Fine of \$5.00 Upon Those Who Refuse To Be Vaccinated—One Pays, the Others Appeal.

Refusal to be vaccinated is going to be a costly proceeding in Cambridge if the board of health has its way. The board is determined that citizens shall submit to its ordinances or take the consequences, and to emphasize its determination it bad four citizens before the third district court Wednesday morning, charged with refusal to be vaccinated. Each one of the four was fined to by Associate Justice McDaniel, who occupied the bench in the place of Judge Almy. The court did not make much on the operation, however, since none of the fined ones paid on the spot and three of them



Upon the principle of self-defense, of paramount necessity, a community has the right to protect itself against an epidemic of disease which threatens the safety of its members.

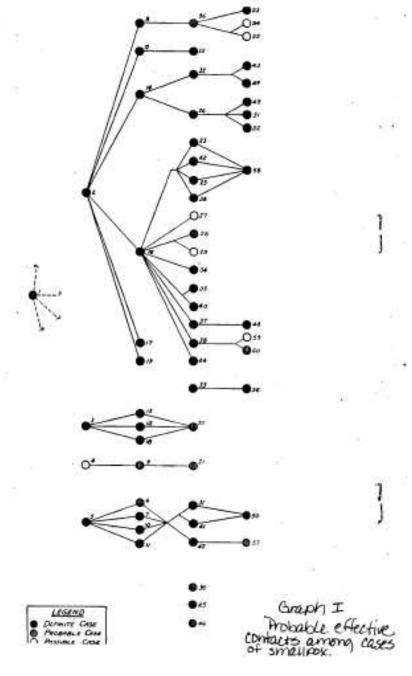
# Jacobson: Key Holdings

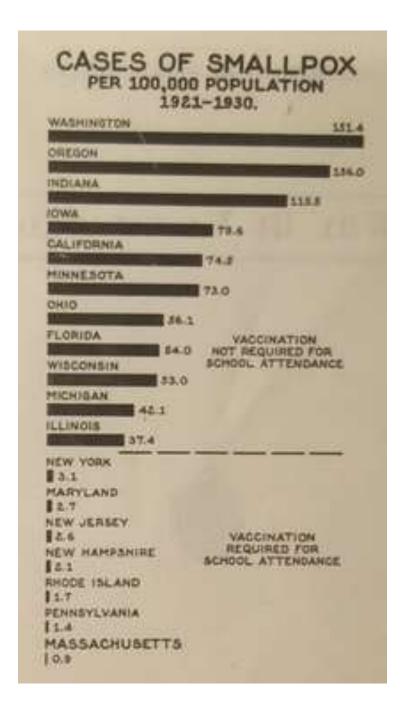
- Police power upheld
- \*No absolute right to be wholly free from restraint, restraints necessary for the common good
- **❖**Deference to legislature
- \*Public health intervention depended on:
  - **❖**Public health necessity
  - **Reasonable means**
  - **Proportionality**
  - **\***Harm avoidance

## THE RECENT SMALLPOX OUTBREAK IN FITCHBURG\*

BY ROY F. FEEMSTER, M.D., GAYLORD W. ANDERSON, M.D., ROBERT F. BURNS, M.D., AND HENRY M. DE WOLFE, M.D.

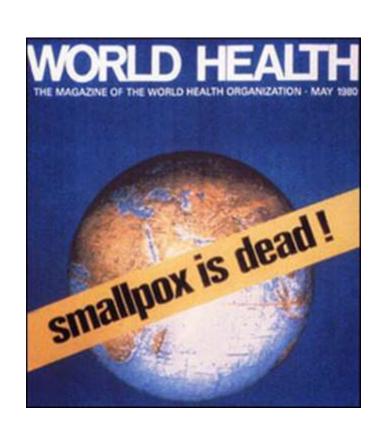
CMALLPOX in Massachusetts has fortunately become rare due to the enforcement of the law requiring vaccination as a prerequisite to public school attendance. In some instances private school authorities have insisted upon the same protection for the children under their supervision, thus increasing to a higher level the protection of the community. Occasionally, however, smallpox is introduced into a small group among whom a large per cent, due to various circumstances, have escaped vaccination. Such an instance occurred in Fitchburg early in 1932. Smallpox appeared among a group of foreign born residents living in a section separated from the rest of the city. The adults, immigrants from New Brunswick and other Canadian Provinces, had come to this country after school age, thus escaping the vaccination law, which applies only to public school children. For this reason there existed a large number of susceptible adults in addition to the usual group of preschool children.





In 1972, the Massachusetts Legislature passed "An Act Eliminating the Requirement of a **Smallpox Vaccination for School Attendance,**" which amended section 15 of chapter 76 of the General Laws. Smallpox vaccine was removed from the list of required vaccinations for students in the Commonwealth of Massachusetts. After nearly three hundred years of smallpox affecting Massachusetts life, death, and politics, the disease was gone.

# **Smallpox Vaccination**



- **\*1972 Routine childhood vaccination discontinued**
- \*1976 Vaccination of HCWs discontinued
- **❖1983 Distribution to civilian population discontinued**
- \*1990 Vaccination of military discontinued
- **❖2003** − Military and civilian vaccination program



# **Colonial Tobacco Control Proceedings of the General Court**

#### **October 3, 1632**

It is further ordered, that noe pson shall take any tobacco publiquely, vnder paine of punishm<sup>t</sup>; also that effy one shall pay j<sup>0</sup> for enery time hee is convicted for takeing tobacco in any place, & that any Assistant shall have power to receave evidence & gine order for the levyeing of it, as also to gine order for the levyeing of the officers charge; this order to begin the 10<sup>th</sup> of Novemb<sup>r</sup> nexte./

### September 3, 1634

Further, it is ordered, that noe pson shall take tobacco publiquely, vnder the penalty of ij\* vjd, nor privately, in his owne howse, or in the howse of another, before strangers, & that two or more shall not take it togeather, any where, vnder the aforesaid penalty for edy offence.

Likewise, that victulars, or keeps of an ordinary, shall not suffer any tobacco to be taken in their howses, under the penalty of v<sup>s</sup> for eig offence, to be payde by the victuler, & xij<sup>d</sup> by the pty that takes it./

#### March 4, 1635

It is further ordered, that noe pson w'soeuer shall either buy or sell any tobacco within this jurisdiccon after ye last of Septembr nexte, vnder the penalty of x' a pound, & soe pporconably for more or lesse to be paide by buyer & seller, & that in the meane tyme noe pson shall buy or sell any tobacco att a higher price then it shalbe valued att by the Goûnr for the tyme being, & two other, whome hee shall please to chuse, vnder the penalty aforesaid.

### **September 26, 1637**

THE law against buying & selling tobacco is repealed./
Mr John Greene, of Newe Prvidence, is referd to the magistrates at

### **November 2, 1637**

All former lawes against tobacco are repealed, & tobacco is set at liberty./ 342.

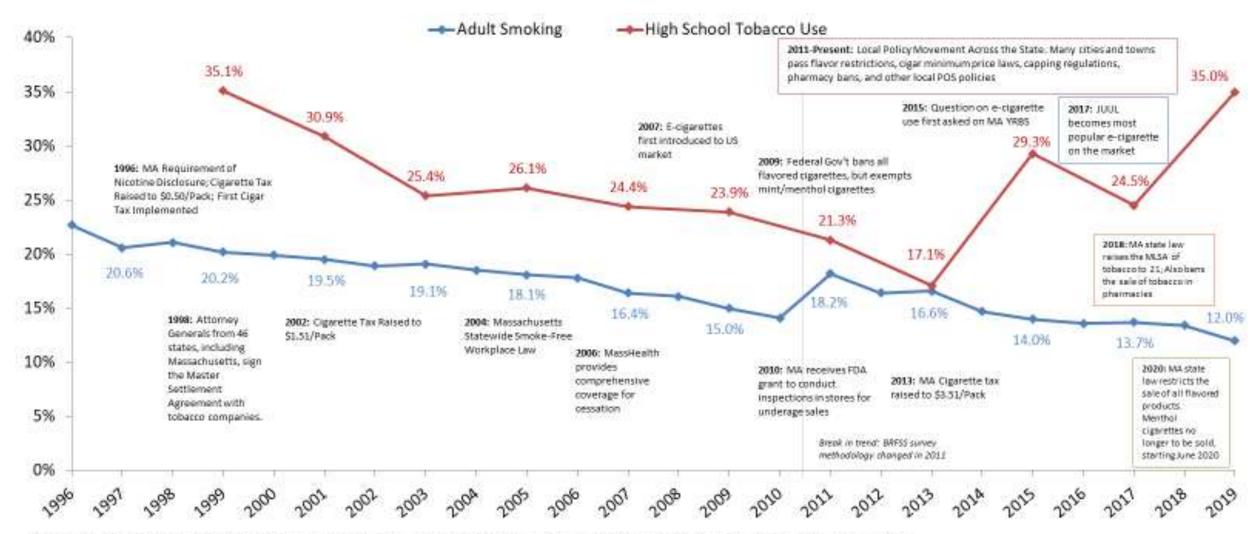
### September 6, 1638

This Court, finding that since the repealing of the former laws against obacco, the same is more abused then before, it hath therefore ordered, that no man shall take any tobacco in the feilds, except in his iourney, or at meale times, vpon paine of 12<sup>a</sup> \*for every offence; nor shall take any tobacco in (or so near) any dweling house, barne, come, or hay rick, as may likely indanger the fireing thereof, vpon paine of x<sup>s</sup> for every offence; nor shall take any tobacco in any inne, or comon victualing house, except in a private roome there, so as neither the master of the same house, nor any other guests there, shall take offence thereat; we'll if they do, then such pson is fourthw'll to forbeare, vpon paine of 2<sup>s</sup> 6<sup>d</sup> for every offence.

### **Tobacco Control Milestones in Massachusetts**

1632	Tobacco prohibited
1637	Tobacco allowed
1783	State excise tax on tobacco
1886	Sale of tobacco products to those under 16 years of age prohibited
1909	Sale of cigarettes to those under 18 years old prohibited (for snuff and other tobacco products the age is 16 years)
1945	Excise tax on tobacco products
1949	Excise tax of 10% retail price of tobacco products to go to old age assistance (Repealed in 1950)
1975	Smoking prohibited in elevators and supermarkets, designated areas required in other public places
1980	Greg Connolly joins MDPH
1985	No tobacco product may be sold to anyone under 18 years of age. Oral snuff classified as a hazardous substance, with warning required
1986	Excise tax on smokeless tobacco
1987	Law limited smoking in some public places, non-smoking areas defined. Use of tobacco prohibited in public schools.
1991	The Coalition for a Healthy Future (Tobacco Free Mass) forms
1992	Ballot initiative passes, new \$.25 tax per pack on cigarettes (Excise tax from \$0.26 to \$0.51) for tobacco education and control programs
1993	Massachusetts Tobacco Control Program
1995	Sports stadiums and shopping malls ban smoking
1996	Tobacco Product Disclosure Law. First cigar tax. Cigarette tax goes from \$0.51 to \$0.76 to fund health care needs.
1997	First statewide training program in tobacco treatment
1998	Tobacco Master Settlement Agreement. Public pension funds divest tobacco stock.
1999	Attorney General requires warning labels on cigars and enacts regulations to restrict underage access and advertising near schools and playgrounds
2002	Cigarette tax goes from \$0.76 to \$1.51
2004	Statewide ban on smoking in all workplaces, including restaurants and bars
2008	Cigarette tax goes from \$1.51 to \$2.51
2013	Cigarette tax goes from \$2.51 to \$3.51
2018	Omnibus Tobacco Act
2019	Act to Modernize Tobacco Control

## Policy and Tobacco Trends in Massachusetts



Note: From 1999-2013 high school tobacco use includes current (past-30-day) use of any cigarettes, cigars, smokeless. From 2015-2019, the definition was expanded to include e-cigarettes. Data Sowces: Adult smoking: Behavioral Risk Factor Surveillance System; Youth Tobacco Use 1997-2017; MYRBS; 2019: HS MYRB.













Get facts and tips at

GetOutraged.org

## Big Tobacco targets kids.

The more they're exposed. the more likely they are to smoke

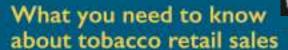
> It's a fact: Research shows that kids who two or more times a week are 64% more likely to start smoking than their peers who don't.

mass.gov/vaping @@GetTheVapeFacts

Vape Pod

Massachusetts

Secondhand smoke hurts. GET THE FACTS



Free, andeymous debie training for store personnel about tobacco sales. Extravamento anómini y grasulto an lineo sobre la vivita de cabaco paco el servined de la Sando

Available in English and Spanish

**BEFORE YOU** 

telefoliet



Smoking and vaping are prohibited in restrooms.



## **ADULT** ONLY

**RETAIL TOBACCO ESTABLISHMENT** or **SMOKING BAR** 

Persons under the age of 21 are not permitted to enter these premises at any time.



You can quit smoking!

Talk with your doctor.

**QUITWORKS** can help!





smoke-free area

#### WARNING: Cigars Are Not A Safe Alternative To Cigarettes Or

Smokeless Tobacco Products.



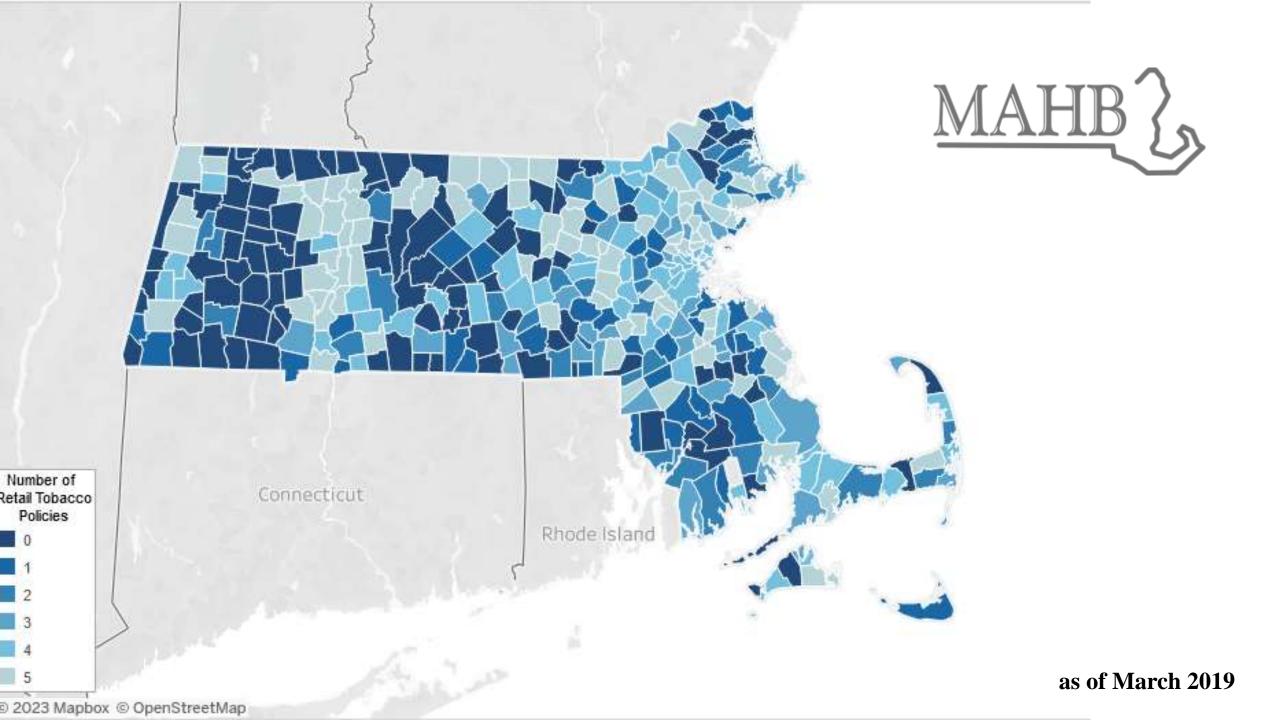
SECONDHAND SHOKE OF AEROSOL

Cigarettes

To report a violation, contact the Massachusetts Department of Public Health at 1-800-992-1895.







#### American **Smokefree Air Laws** Lung Association. WA MT ND MN OR WI ID SD WY IA NE DE NV OH IN MD UT DC co CA KS МО NC OK ΑZ AR NM GA MS

TX

Comprehensive Law, Including Bars and Restaurants

Comprehensive Law Passed, Not Yet in Effect

Strong Law in Effect

Weaker Restrictions

## **Local Efforts**

- **Smoke-free** 
  - **❖In 2001, 85% of the state population lived in a municipality with smoking regulations (up from 22% in 1993)**
  - **❖2004** − state became smoke-free
- **❖**Enforcement, compliance checks
  - **Advertising**
  - **Youth access**
- **❖**Tobacco sales in pharmacies

### **Cumberland Farms**

VS.



**Board of Health** 







Massachusetts Appeals Court dismisses Cumberland Farms, Inc.'s argument that "Jazz" cigars are not flavored tobacco products, and affirms the Yarmouth Board of Health's suspension of the store's tobacco sales permit

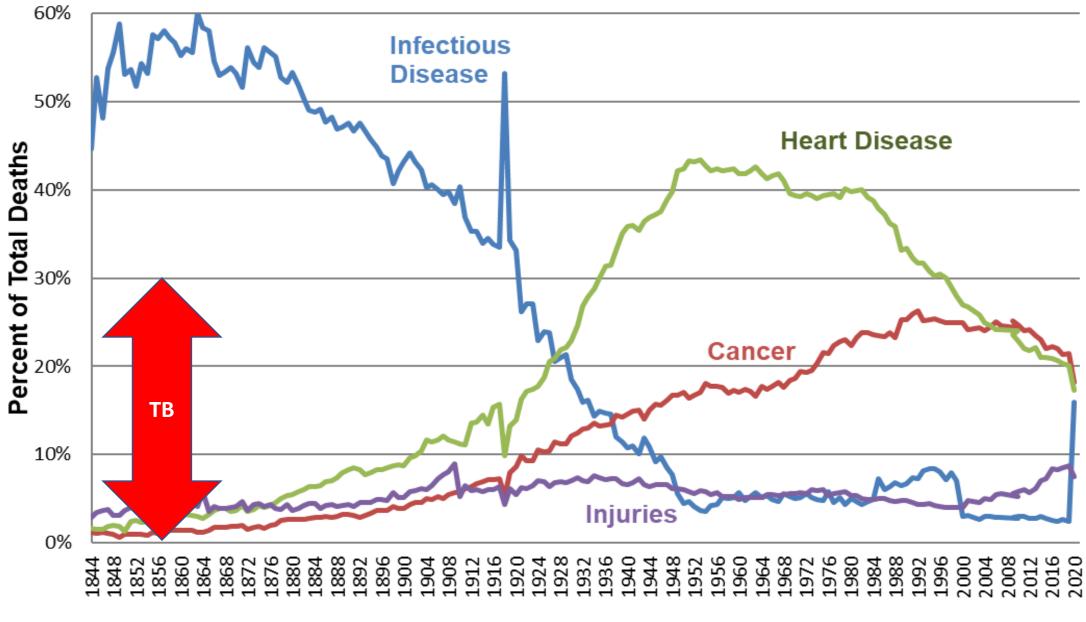
### Massachusetts Law

### **❖Omnibus Tobacco Act of 2018**

- **❖** Raises age of purchase to 21 with exemption
- **❖Prohibits sale of tobacco in pharmacies**
- \*Requires smoking cessation service information at point of sale
- **❖Includes e-cigarettes in definition of tobacco product**
- **❖Includes e-cigarettes in smoke-free workplace law**

### **Act to Modernize Tobacco Control 2019**

- \*Restricts the sale of all flavored tobacco products, including menthol cigarettes and e-cigarettes, to Adult Only Smoking Bars for on-site consumption only
- **❖**Restricts the sale of electronic nicotine products with nicotine content greater than 35 mg/ml to Adult Only Tobacco Retail Stores and Smoking Bars
- \*Requires a state license to sell electronic nicotine delivery products
- **❖** Taxes electronic nicotine delivery systems products at 75% of wholesale price



Year

Robert, survived childhood



Edward ("Eddy"), age 3, TB

### Abraham and Mary Todd Lincoln





William ("Willie"), age 11, typhoid

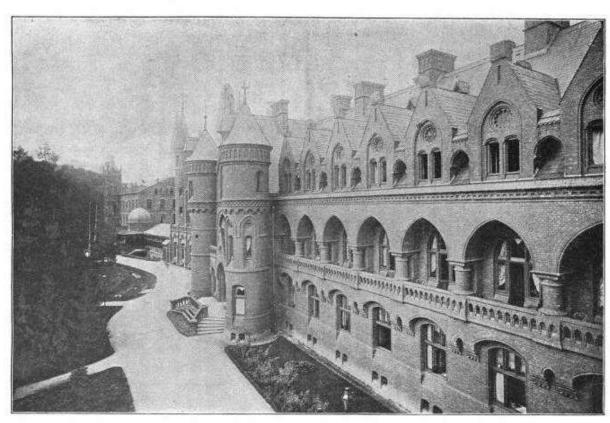


Thomas ("Tad"), age 18, TB

## Sanatoria, 19th Century

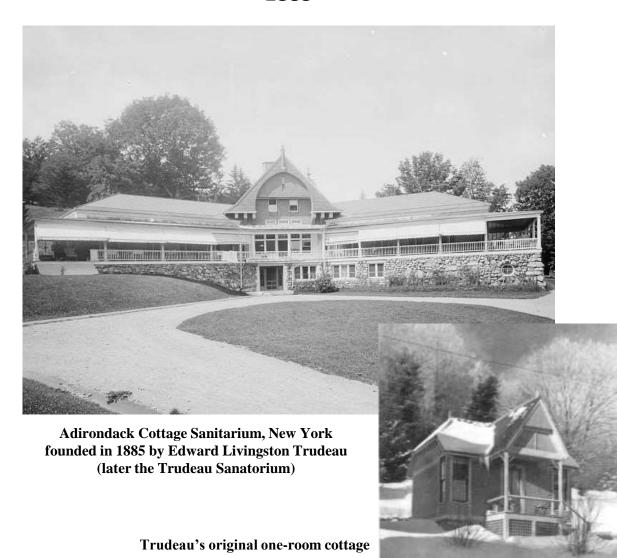
1859

1885

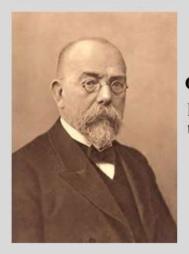


The Brehmer Sanatorium at Goerbersdorf.

Brehmersche Heilanstalt für Lungenkranke



#### The Cause of Tuberculosis



On March 24, 1882, Robert Koch published a paper describing the tuberculosis bacillus as the cause of tuberculosis (consumption)



### X-Rays Allow the Visualization of TB









#### **Tuberculin**

An extract of TB bacilli first prepared by Koch as a vaccine/cure for TB in 1890, but it did not work in that way. It was then adapted as early as 1906 as a skin test for TB infection leading to the skin test still in use today. A bump and inflammation occurs if you have infection, but does not mean you have active disease





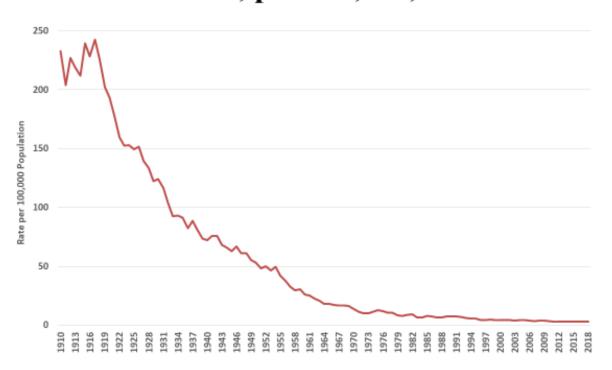
### Bacillus Calmette-Guérin (BCG) vaccine



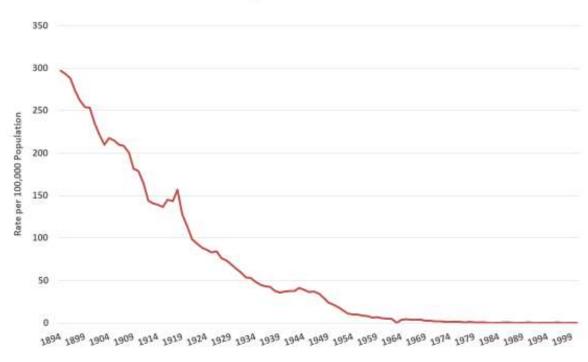
Vaccine against TB introduced in 1921

- ❖ Strain of bovine TB organism
- Efficacy variable among studies
- Works best to prevent serious childhood disease
- Part of routine childhood immunization in many countries
  - Leaves scar as record of immunization
- ❖ Not generally used in low incidence countries
  - Low risk, interferes with interpretation of skin test

# Tuberculosis Incidence in Massachusetts, per 100,000, 1910-2018



# Rate of Tuberculosis Deaths in Massachusetts, per 100,000, 1894-2000

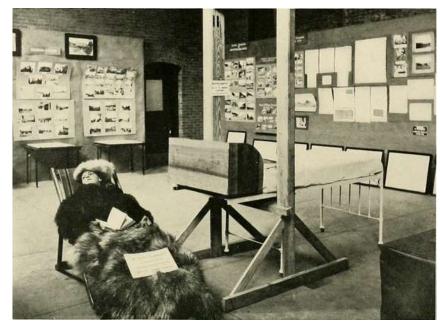


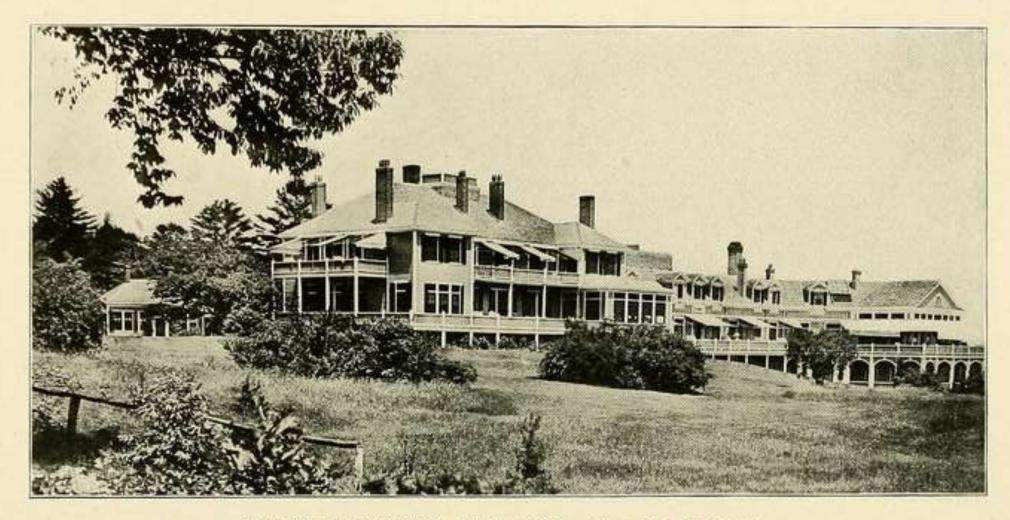
# Post-WWII Drugs Cure TB



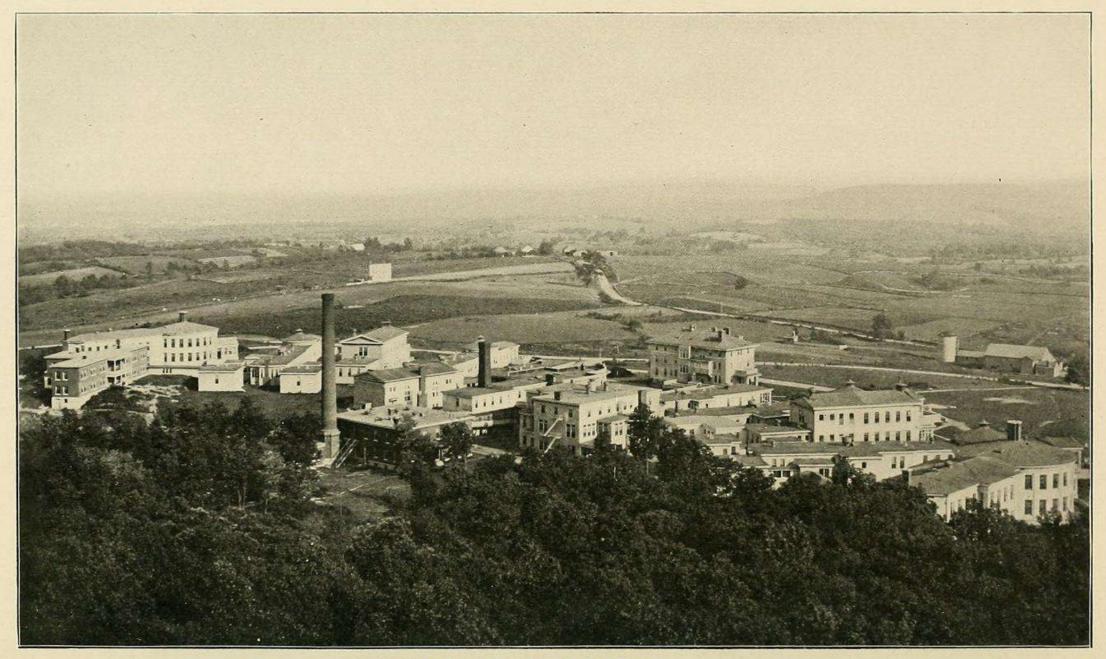
### Mobilization Against Tuberculosis in Massachusetts

- **❖ Rutland State Sanitorium, 1898**
- **❖ Massachusetts Medical Society Districts form Associations for the Relief and Control of Tuberculosis** 
  - ❖ Boston, Cambridge, Springfield and Worcester in 1905
  - **\$ 1906-07** associations in other cities
- **❖ 1904-05** − TB facilities authorized for state hospitals
- **❖ TB exhibition in Horticultural Hall, 12/05-1/06, 26,000 attend**
- **❖** Governor's Commission 1906
  - 1. Reporting of cases and perfecting registration system
  - 2. Thorough application od disinfections, no spitting
  - 3. Formation of anti-TB associations at the local level
  - 4. Hospitals for advanced cases
- **❖** Ch.165, Acts of 1906, prohibition of expectoration; creation of three hospitals
- **❖** Day camps for TB cases in the community
  - **❖** Massachusetts Federation of Women's Clubs
- **❖** State commission to provide for an investigation and report upon a system of caring for tubercular patients by state and local authorities in 1910





SHARON SANATORIUM AT SHARON. From the Southwest.

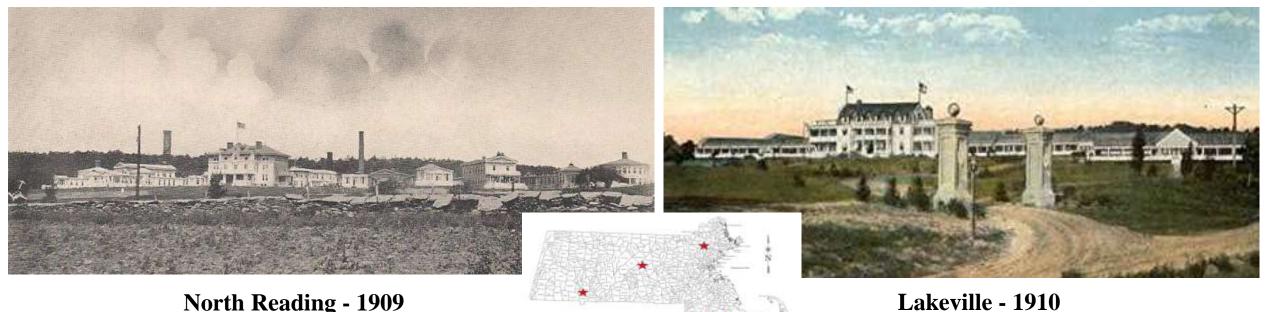


STATE SANATORIUM AT RUTLAND.

Massachusetts. Committee for the 6th International Congress on Tuberculosis, Washington, 1908.

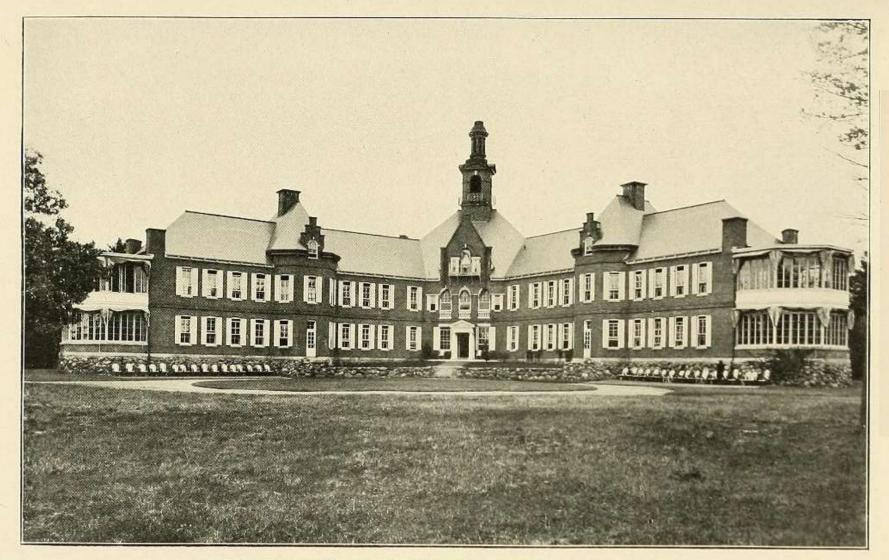
### State TB Sanitoria

**Rutland – 1898** Westfield - 1908



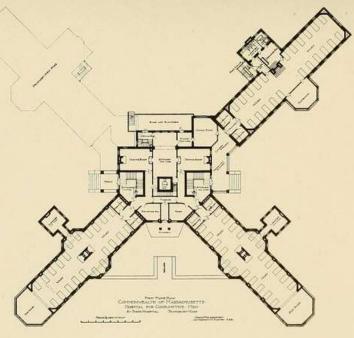
North Reading - 1909



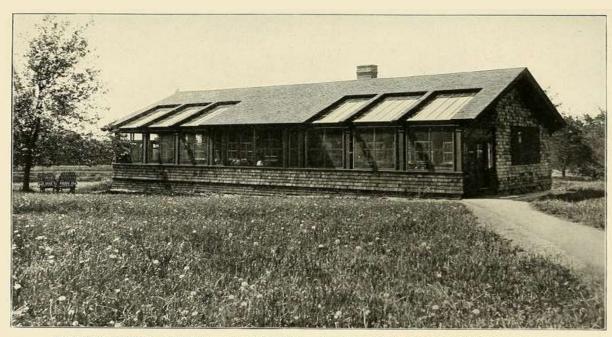


STATE HOSPITAL AT TEWKSBURY. - Hospital for Consumptives.

# Tewksbury Hospital Bancroft Male Tuberculosis Hospital Opened in September 1900 Camp (below) added in 1904



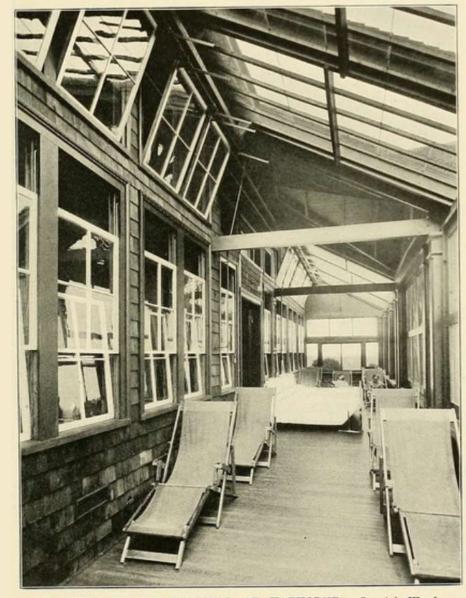




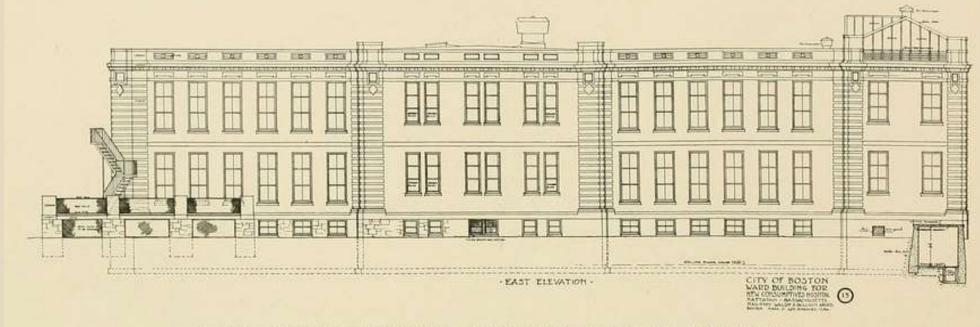
DANVERS INSANE HOSPITAL AT HATHORNE. - Special Ward Building for Tuberculous Patients.

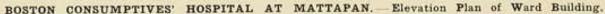


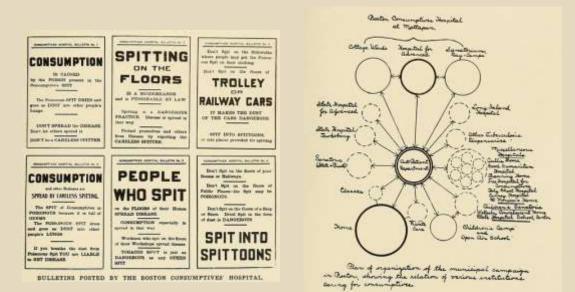
DANVERS INSANE HOSPITAL AT HATHORNE. Special Ward Building for Tuberculous Patients, showing Interior of Ward.



DANVERS INSANE HOSPITAL AT HATHORNE. — Special Ward Building for Tuberculous Patients, showing Veranda.











SLEEPING BALCONY USED BY CLASS PATIENT IN HAVERHILL.



DAY CAMP AT HOLYOKE.

# Promotion of the Welfare and Hygiene of Maternity and Infancy Act ("Sheppard-Towner Act")

- **❖Bipartisan legislation in 1921**
- **Established first social security program funding states for maternal and child health programs** 
  - **❖**Some states declined to accept the funding (including Massachusetts)
- **❖Impact** 
  - **❖3,000** health centers established
  - **❖**Reduction of infant mortality by 9-21%, mostly in non-white and impoverished populations
- **AMA** opposed the act
  - \*AMA Pediatric Section established the American Academy of Pediatrics in response
- **\$**Sunset in 1929
- **❖Support for maternal and child health returned with provisions of the Social Security Act of 1935**

# THE INCIDENCE OF TUBERCULOUS INFECTION IN SCHOOL CHILDREN.

By HENRY D. CHADWICK, M.D., and DAVID ZACKS, M.D.,

Massachusetts Department of Public Health,

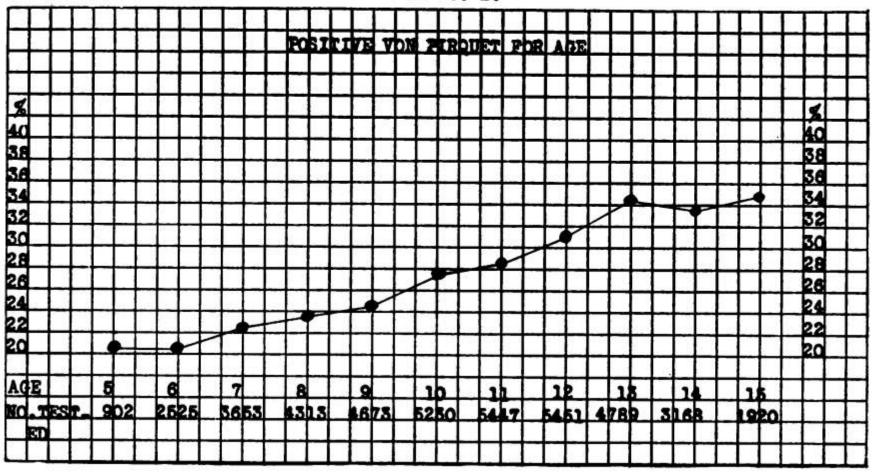
BOSTON, MASS.

The Department of Public Health of Massachusetts began in 1924 a ten-year program for the examination of the school children of the state. The purpose of this work was to find the children who had the primary or juvenile form of tuberculosis, and by treatment and supervision increase their resistance to such an extent that the secondary or pulmonary form would not develop in later years. This study is based on 42,071 children examined and given the Von Pirquet tuberculin test during a period of three years.

#### THE RELATION OF POSITIVE VON PIRQUET TEST FOR AGE.

Age	5	6	7	8	9	10	11	12	13	14	15
Number examined .	902	2525	3653	4313	4673	5230	5447	5451	4789	3168	1920
Number positive	188	511	814	1031	1143	1463	1559	1660	1649	1057	666
Per cent	20.8	20.2	22.2	23.9	24.4	27.9	28.6	30.4	34.4	33.3	34.6

#### GRAPH NO. I.



Chadwick HD, Zacks D. Trans Am Climatol Clin Assoc. 1928;44:196-205.



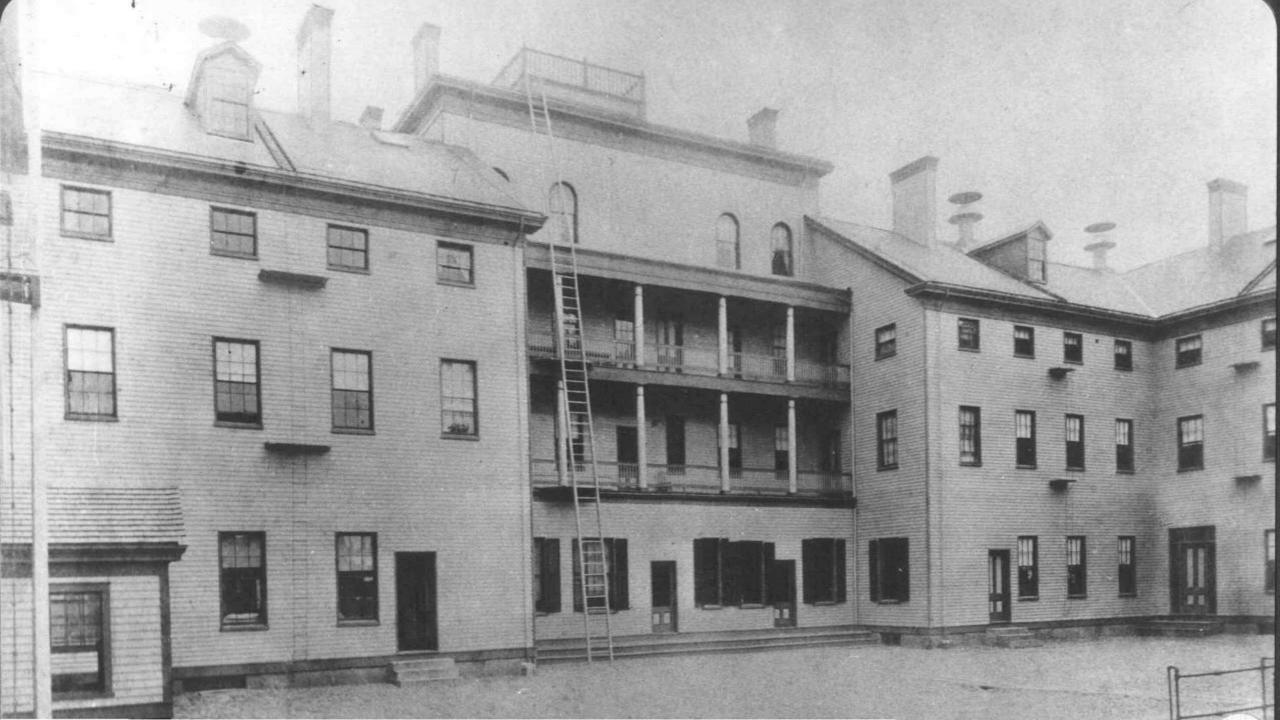
PRENDERGAST PREVENTORIUM FOR CHILDREN 1000 HARVARD STREET, MATTAPAN, MASS.

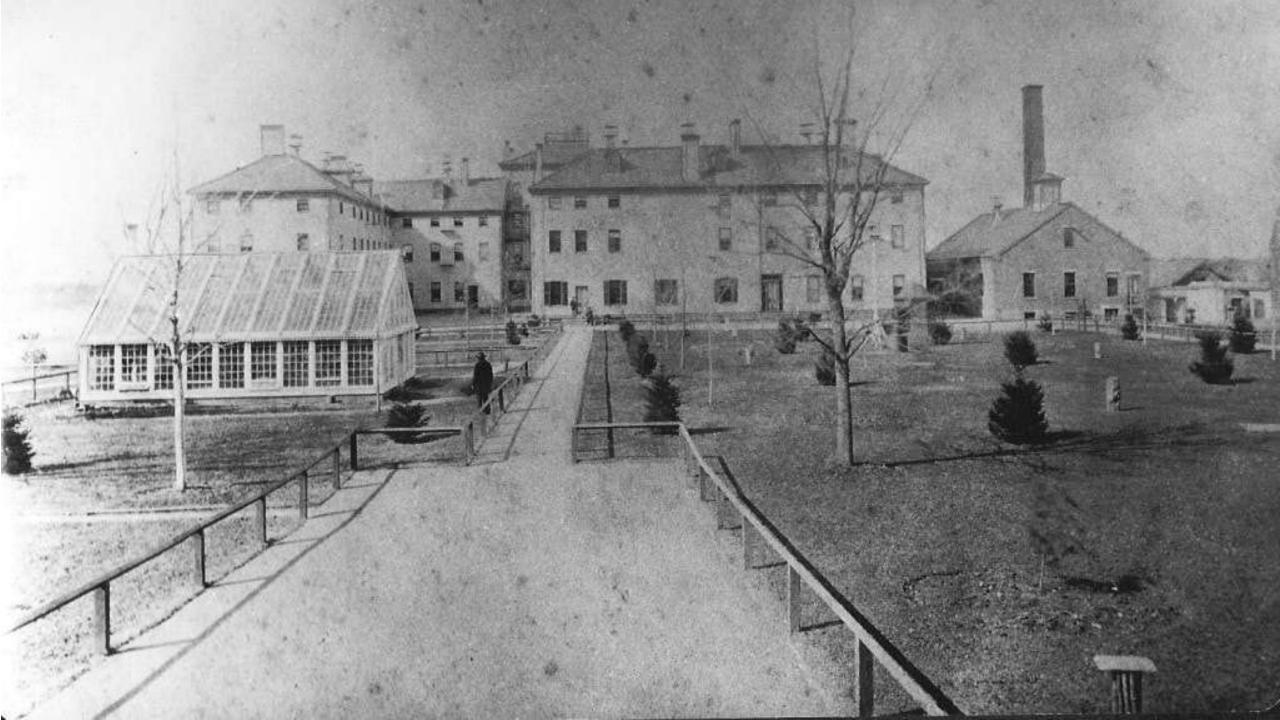
### Management of the Preventorium Child

- 1. Contact with the tuberculous adult, who presumably has infected the child, must be broken. This is done by removing the tuberculous adult to a sanatorium, or by taking the child out of the home. If both of these expedients are impractical, every member of the household must be taught the principles underlying the transmission of tuberculosis.
- 2. The child must be relieved of all possible strain, which means the avoidance of strenuous exercise and burdensome school work. Rest is the cornerstone on which preventorium care is based.
- 3. The child's health must be built up, which means that all physical defects must be corrected and the benefits of good food, sunshine and fresh air must be made available.
- 4. The psychology of the child must be adjusted so that he will not think of himself as being inferior to others with greater margin of resistance, and yet restrain overambitious impulses.



























### **Public Health Museum Services**

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