

Date	Oct 16 1981
Author	DA Henderson
Title	Application of epidemiology to smallpox eradication
Event	Medical students Dept of Community Medicine
Event Sponsor	Mt Sinai School of Medicine
Event location	New York NY
Notes	Speech list includes notation "standard Epi 1 lecture" but no original paper for that lecture (listed as delivered Jan 5 1981). This appears to be a photocopy of that lecture and lists dates of both lectures.
Publ as	

Date	Jan 5 1981
Author	DA Henderson
Title	Application of epidemiology to smallpox eradication
Event	Epidemiology 1 course

Event Sponsor	JHU School of Hygiene & Public Health
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Event location	Baltimore MD
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Notes	No paper in speech book. However, lecture of Oct 16 1981 at Mt Sinai School of Medicine included this photocopy listing dates of both lectures and labeled "standard Epi 1 lecture".
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Publ as

- Lesson learned + *but one important message did emerge i.e. the fact that a critical foundation will have to be laid*
- Today - Discuss the ~~concept~~ relative merits and prospects of ~~discuss~~ eradication as ~~concept~~ ~~to discuss~~ in public health.

Jan 5 1981

Not an academic discourse but a practical problem in P.H. strategy

~~Prospect for success and the difficulties of~~
~~Practical aspects of executing such a program - rooted in your institution~~

Interest in ~~eradication~~
SVs - 60's
& measles debate

5.8.80 WHA declared that smallpox had been eradicated throughout the world - 1st disease program to have succeeded.
 Vaccination progs. are being stopped - net savings > \$1 billion/year.
 revived interest in the concept of eradication.

- Inevitable consequence - two meetings so far this year of >100 scientists and policy makers from the and other countries to decide what next should be eradicated.

Proposed - Measles, Polio, urban rabies, tuberculosis
 Traffic accidents, Hunger, poverty, cancer

"Religious mission overtones - disquieting - ~~disrespectful of faith~~ ~~disrespectful of faith~~

- Are there other diseases & problems to be eradicated? If so, which should be undertaken and what ~~strategy~~ ^{might be the} strategy?

Public health policy is implied - important that we define terms and objectives so that we know where we are going
 deeply concerned that in p.h. we set realistic goals & realistic expectations of fulfillment -

Dictionary - "eradication"

derives from the Latin "to pull up by the roots", "to destroy utterly"

~~Two~~ Two components - an action

- implication of time - persistence

when used in respect to hunger, poverty or road accidents -

the term is ~~absurd~~ ^{use of the} ~~absurd~~ Its application in this context

I ~~need~~ ^{need} not further discuss and let us hope that the term will not be ~~applied~~

Eradication of species is entirely possible and this has occurred.

Through nuclear war, we may indeed achieve such an objective & man.

This is a problem about which in public health must be concerned

but today my remarks will be confined to the prospects for

achieving ~~eradication~~ ^{eradicating} ~~rather than preventing it~~ eradication of species ~~rather than~~ ^{other} ~~the~~ ^{man} ~~eradication~~

Through ~~careless use of~~
 the term ~~eradication~~ ^{as an objective}
 we risk being as ill-served and
 as disadvantaged as we are now
 being ~~ill-served~~ ^{ill-served} by WHO's
 commitment to bring "health
 & well by the year 2000".

- Expensive
- loss of interest by countries
- Bechuanaland & Central Province

- Forms of defining ^{a specific} ~~academic~~ objectives, much to be preferred.

Question of beginning
the program in the
place - Africa

- Strategy - systematic spraying followed by surveillance.

Mistake 2 - Answer lay in a car of fully supervised execution which was the same for all countries. (Purely administrative - conducted the interrogations)

Mistake 3 - ~~Surveys~~ Although the objective was 'O' cases of malaria, this component of the program received little attention. This

1958 - Smallpox was the biggest mistake -
- never see.

1958 - Smallpox - new vac. ~~1966 - Global erad. of smallpox.~~ - succeeded because of epidemiology - ^{surveillance} ~~surveillance~~
Focus on epidemiology and an essential tool of epidemiology - surveillance. Contrast to millions vaccinated.

Pages 2-3 ~~AK~~

STRATEGY

Pre 1967 → remainder 80% → 100%

Research
Prog. acc.
surveillance

Research
Prog. acc.
surveillance

Beginning in 1967 - ~~STRATEGY~~ Many steps re: vaccine quality + vac. device

Important change was the approach - epidemiological surveillance

[Until then - in terms of numbers vaccinated]

LANE MUR Continued watchfulness over the distribution and trends of incidence through the systematic collection of data, consolidation and evaluation of morbidity and mortality reports. Intrinsic to the concept is the regular dissemination and interpretation to all who have contributed and to all others who need to know.

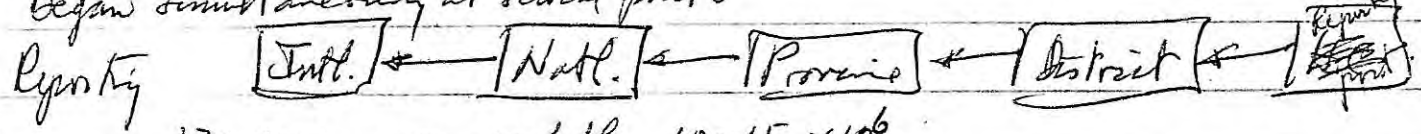
Reporting of cases was obviously essential - to function, we needed to obtain reports of cases by country, by province, by District ~~Rep~~ and to report back to all those reporting and concerned with control what was happening.

Manual - 1967

"Every case is in some way a failure of the program - failure to protect through vaccination; failure to prevent spread - continuing epidemiologic analysis of cases permits the program to be monitored and permits corrective measures to be applied."

Morbidity reporting ^{foundation} - frequently derided. Incomplete, inaccurate, can't measure the true incidence. All true. To the academic scholar, the data are messy and uncertain. For the practicing epidemiologist, however, a valuable, essential tool is Type & How.

467 - 1^o objective to obtain the "best available data" ^{Target '0} (acronym BMD)
 began simultaneously at several points



131 000 - probably $10-15 \times 10^6$

Principle - weekly report from each unit whether or not cases detected.

- minimum essential info to make decisions

Intl. - ^{Cases by country, province, district} Surveillance reports & Photograph

Suppression of cases - use of other sources for ^{info} but not data.

Natl. - Cases by Province, District, H.C. each week

Surv. reports -

Simple } Brazil example.
 Interpreted }

Prov. - Line listing of all cases from District and H.C. - each week

• Restrict data to that which is needed - "line listing"
 known world not get all cases - one side of one page. - (problems of the academic scholar in this setting)

What did we learn - District - H.C. - "line listing" - name, age, sex, ^{willows} date of onset, vac. status.
 ident. of "reporting points" - ^{reporting points are indicators only} surveillance techniques in Africa - search in literature.

Vaccination program in all countries - original strategy.

Focus on where the smallpox was - not homogeneous. - ^{Maracyclo}

Primary vaccination - 3 yrs. - surprise

Rural houses vs. traditional dwellings

Afghanistan program

Serendipity ~~in Africa~~ - assuming 80% vac; slow developed psychology

Nigeria -

Indonesia

SURVEILLANCE OVERSILL -

Focus on cases, ^{efficiency of} prev. good. improved, strategy continually developed & improved

(4)

Our principal problem throughout were these:

- + Didn't have global totals as to nos. vaccinated
- + Trying to explain how successful we were in the face of rising totals of cases
- + Didn't have data on deaths.

The bottom line, however, was that on 26 October 1977, the last case of smallpox occurred. Smallpox was eradicated. Difficult - just barely succeeded.

Disadvantages - No one will vaccinate in long term - cannot afford to (e.g. the)

~~Two other diseases are being widely discussed as prime candidates for eradication - polio, diphtheria and measles. Is it feasible?~~

~~Let us look at these with many techniques in smallpox~~

+ Can we eradicate others? Should we, as a p.h. policy, undertake global eradication of another disease?

Most attractive are diseases ^{causing virus} ~~subject to~~ for which we have effective vaccines & providing durable immunity. If a drug is required, it necessitates the early discovery of ~~vaccines~~ and detection of cases, their treatment and Rx of contacts. With civil disorder & prog. disruption, one effectively ~~begin~~ may have to begin almost from the beginning. ^{Emergency} ~~Resistant~~ from vaccine is, however, possible.

(5) + Two prime candidates

(6) Disadvantages

Explanation disadvantages

Rate of transmission

Contrast age spx/measles

Geographic problem.

(7) Measles - the vaccine problem. over 15×10^6 per year. Did not help get measles under control.

(8) Spx eradication was incredibly cost-effective - for 20 billion annually in savings.

(9) In brief, spx eradication barely achieved. Don't see another disease for eradication. ^{And how to do it?} One thing I know we can eradicate and that is the word "eradication".

my view was selfish and par in itself. I was primarily to justify a decision already made.