SMALLPOX

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8/89

Smallpox – A disease you will never be called upon to diagnose but nevertheless a program about which you should know for several reasons which I shall note.

- Throughout hx – world's most devastating disease
  - + World-wide –
  - + 20 %+ case-fatality rate / essentially everyone contracted the disease.

e.g. Europe – rel. to industrial revolution
Americas – Aztecs-Incas / Colonization of N.A.
Again & again changed course of hx – footnote to hx: Jenner

Fear of disease – resulted in immunization throughout world into the 70's
U.S. – last case in 1949 / until 1971 (22 yrs. later) compulsory vac.
Europe – hosps. in U.K. & Germany

- An intensive eradication prog. began (under WHO) Jan. 1967 – last case Oct 26 1977
  After 2 years of work to confirm.

① WHA #1
② WHA #2

This P.M. – would like to review (briefly) w/ you ~~briefly highlight~~
- Nature of the disease ~~& the epidemiology~~.
- Salient ~~features~~ strategies of the erad. prog. as some have significant relevance to other dis. control progs.
- Evidence that transmission has been interrupted
- Questions which remain
  - ? continued storage / vaccines
  - ? merits of continuing vaccination in the military.

3. A virus of the orthopoxvirus family – one of the largest of the viruses
4. Disease
5. "
6. "
7. European cases
8. "
9. Blindness.

Features which were favorable & used. (9B)

1. • No animal reservoir
2. • No carrier state – transmission for brief period only
3. • Permanence of recovery
4. • ~~Diag~~ Surveillance – comparatively easy – spread free & fast contact – trans. stopped in remote areas
   - No subclinical cases
   - Recognized by villagers & accuracy
   - Persistent scars in 75%
5. Transmission in remote area
6. • Vaccine – exceedingly heat stable
   - inexpensive / easy to administer
   - Nearly 100% protection for many yrs & one inoc.

Concept that eradication was a feasible proposition and should be pursued was not advanced until 1958

Zdanov

Program 1959 – 1966 little progress; little support; doubts about cost; René Dubos (with Rem)

Strategy – 80% vaccination

1966 – WHA 2.5×10^6 / 10 centers ($50 000)

10 year prog. ~~50 cases~~ why?

10. States 1967 –

Strategy
1. Vaccination
2. Surveillance.

Vaccination

(11) Vaccine — ~~Minimum~~ Acceptable quality vaccine — with. labs. Holland/Canada.

LESSON

(12) Devices — Simplification of technique — RESEARCH

LESSON

(13) Surveillance — "Every case a failure ...."

Morbidity reporting — frequently derided as being incomplete & inaccurate
but, for the practising epid, a valuable and essential tool
BEST AVAILABLE DATA (BAD)

How? local level → hire history → weekly report all ctrs.
not to difficult. Team + outbreak invest.
State/Prov. level → weekly report thro program, not stat. office
National level ditto

Important to follow trends and to distribute info widely (Natl. reports Dist. reports)

- ∏ surv. ↑ and # of cases falling — program even if unquantifiable.
- Advantage of natl. interest ↓ ↑ cases (Brazil & India)

What did we learn — contrary to textbooks

+ Smallpox spread slowly —
~~&~~ & isol. of pt. + vac. of contacts — stopped transmission when ~50% vac. and did not stop when 95% vac. but no surveillance. (↑ SURV-CONT.)
+ Vacc. immunity — remarkably durable
+ Strategy of prog — Afghanistan

LESSON —

(14) 1967
(15) 1970
(16) 1973

Sample surv. - cont.

Strategy of America & Africa not effective on outbreak.
Movement of population
Suppression of reports.
Summer - 1973 - strategy

(17) U.P. results.

(18) Asia progress

(19) Ethiopia — Refs. — Size 100 people
War
Disperse pop.

(20) Ethiopia - Somalia carriers

(21) Mali Madeira.

How could we be certain —

Surveillance — 2 yrs. for last case —
Small pox spreads by chain of transmission —
Empirical evid — spx persisted up to 8 mos. in country & detection.
Techniques — Search
Reward.
International Commission —
Global Commission

Rumors.

? Animal reservoirs — difficult to prove & negative.
Monkey pox.

Questions which remain

Stores of variola virus –

How we got ☆ 2 labs.
Why Atlanta + Moscow — No research in progress
Do we destroy or not.

?Vaccination of military

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(22) Risks of vaccination.

(23) PVE – not diff. from postvaccinia
(23) Vac. necrosum
(24) Ecz. vacc. – READ
(25) lesions
(26) Generalized vac. – READ
(27) Accid. infect – READ
(28) Pt.
(29) Pt.

Need to keep people in base
Division of risk of BW. –
Hx U.S. inf.
Hx USSR inf.

Part IV

- Benefits / costs
  10-15 → 0
  Cost = $100 × 10^6
  Savings > $1 × 10^9 / yr.

Lessons. ① Reasons
- Community-based prog. – only possible approach ? relevance of health services.
- Health care systems are not health care systems – "sickness care"
  hosps. / 1° Hlth ctrs. – relevance for vacc. + children brought in
  e.g. Vaccine coverage –
  "Curative medicine always drives out preventive cures" e.g. – Brazil
  No goals except to & those who attend clinics.
  Who cares how many are dying of smallpox, measles + pertussis ?
- Principle for the future – community-based services – need to strike a balance
  not that clinical care unnecessary – cost/benefit ratio.
  ~~my own experience and viewpoints~~
- EPI – 6 diseases
  2 → 70%
  Polio eradn.
- ORT
- Vit A
- Fam. planning.

② Surveillance

③ Research

Objectives: ① Health for All
② Multipurpose workers
③ Availability of resources.

Close: Chandi – "Let the sick die if you could show me how to prevent other from dying"