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Event	Wade Hampton Frost Society
Event Sponsor	JHU School of Hygiene & Public Health
Event location	Baltimore MD
Notes	
Publ as	

Epidemiology & Eradication

Rather than a lecture - like to look at the evolutionary application of epidemiology to the smallpox erad. As the approach and methodology has been the basis for erad. of polio & Guinea Worm.

Begin at the beginning

1958 - Russian initiation

1964 - 1st Expert Com. on ~~erad.~~ smallpox erad. - a monograph - an inventory of what we know at the time.

Disease - Virus, 10-12 day incubation period, cases reasonably typical & reasonably easy to diagnose.
~~Death~~ Death rate - 20 to 30% so all countries doing some vaccinating

Reporting - all countries required to report by international

governing agreement - (no one believed the numbers).
The numbers actually didn't work. (all that bad but why is it not working well?)

Why is it not working well?

How ~~good~~ ^{protective} is the vaccine?

What was recommended?

1966 WHA gave the go-ahead for a global programme \$2.4 x 10⁶.
At that time, not a large no. of people who believed erad. possible.

④ Where ~~were~~ the problems?

You ^{are} an epidemiologist - what do we do next? ^{ask} ^{the} ^{policy}
~~What kinds of programs and where?~~

Obviously encourage national programs, but what sorts of programs and where. You've got ~\$5000 per country & about 200 staff.

→ WHERE ← Begin in the easiest not where problem is largest
Have the tools
W. Africa
Endemic
Portugal

2 parts to strategy

Vaccination

②

Surveillance - containment

Vaccination

? Clinics/hospitals.

⑤

What kind of a record?

? Name, address, etc.

? Evaluation - how would you do it?

KISS !!

⑥

Afghan evaluation sheet

EPI - Quick & Dirty

Surveillance -

Who should report?

How do you get them to do so?

What do you report.

Fam. & young kids

⑦

India sheet - minimum data

POINT: PRIME VACCINATION -

POINT: SPREAD COMPARATIVELY SLOWLY -

POINT: How difficult to contain.

POINT: Vao. potency

~~How complete is the reporting? Don't this a problem?~~

⑧

PRACTICAL POINT - How do you search a village?

How complete is the reporting - isn't this a problem?

How do you know where you are?

⑨

Brazil - the principles of surveillance.

⑩

India

Surveillance is the
engine and the heart
of the program!

The surveillance data provided as ~~valuable~~ invaluable info. and strongly suggestive hypotheses which were helpful to confirm in the field.

OVER

Vaccine efficacy studies - > 90% at 20 years.

Transmission studies - Sheffield/Hynde Dist.

Thomas - JHU

Major outbreak area - if held for all of hk. ~5000 cases.

Point; Seasons / cities

From the mumps program - field exp., esp. surveillance was the lynch pin of the program.

Preventing disease, not vaccinating children.

A lesson entirely lost to ^{WHO} EPI and to CDC: NIP.

i.e. No surveillance in EPI until 1985 - ^{in America} - no time
in fact, a Torjan here to est. a surveillance program for other diseases as well.

Just like dyp. -

① Begin in major hospitals + rehab ctrs.

② Expand to all health ctrs. - now 20000

③ Weekly report - + or -

④ Simple line listing.

⑤ Every case invest. covered. by exp. + specimens obtained.

⑥ Data analysed + reports sent back / widely distributed.

How does polio spread - think vectorially

Hypothesis - like dyp - cities the reservoir

5 years from beginning to last cases.

④

Global polio program - "Gradually" developing surveillance program
but no country now which fulfills criteria. Inadequate program

- ① 80% of all health units report ~~within one week~~ ^{weekly and on time}
- ② That > 80% of cases are investigated in 48 hours
- ③ That > 80% of stool specimens in 14 days p onset.
- ④ AFP indicator.

NIP - Should have reasonable surveillance for all vaccine prev. diseases.
1989-90 - Major measles epidemics NVAC NYC.

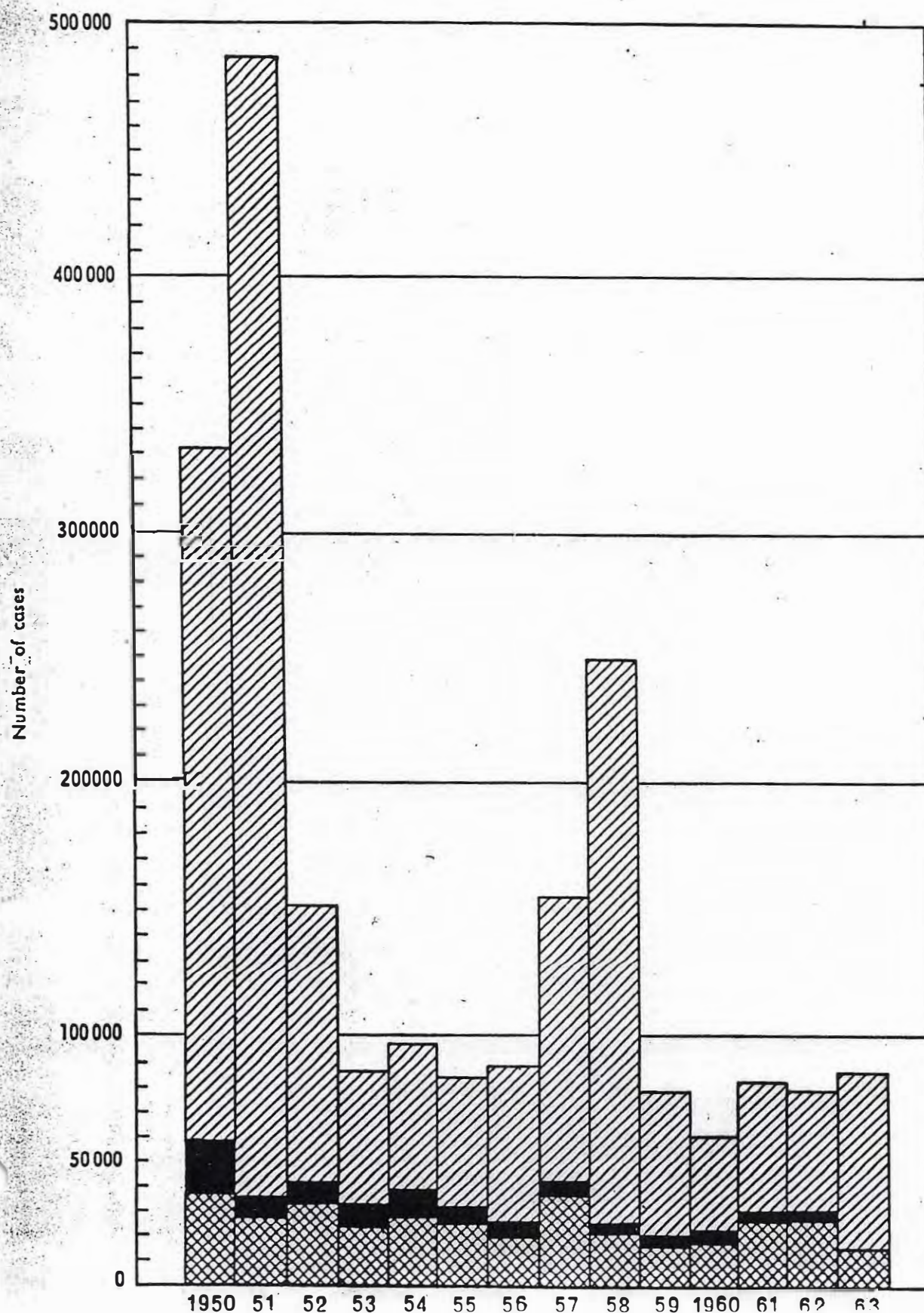
Rubella - should be ~~cases~~ but not collecting data on cases

Polio - case forms requested 1993

Have't received in 5 or 6 years.

Completely missed the fact that poor DTP being employed.

SMALLPOX INCIDENCE IN AFRICA, AMERICA AND ASIA, 1950-63



1964 WHO EXPERT COMMITTEE

Principal factors in failure of smallpox eradication

- + Incomplete vaccination coverage**
- + Shortage of equipment, transport, personnel**
- + Failure to conduct concurrent evaluation of
vaccination campaigns**

1964 WHO EXPERT COMMITTEE

Vaccination immunity

Duration

< 3 years	99 %
4-10 years	85 %
11-20 years	50 %
> 20 years	0 %

Recommended frequency of vaccination

Non-endemic areas	5 to 10 year intervals
Endemic areas	3 to 5 year intervals

1964 WHO EXPERT COMMITTEE

Solutions

1) Use freeze-dried vaccine

2) Vaccinate 100% of the population

(Complete major centers in 6 months^o)

Examine each vaccination site after 6-8 days

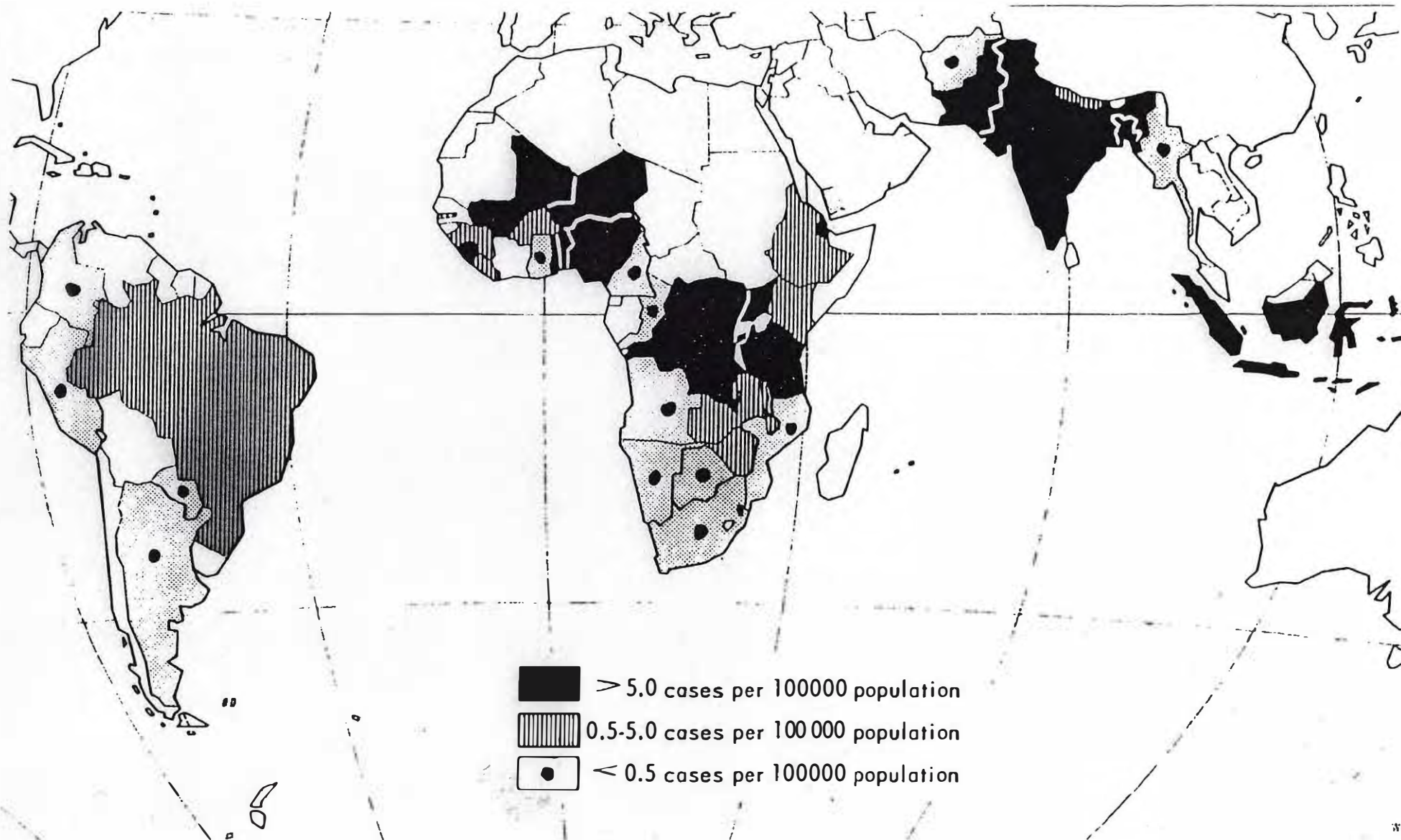
Revaccinate those without a reaction

3) After mass vaccination is complete

Continue vaccinating newborns and migrants

Investigate cases and do “ring” vaccination

47



VACCINATION TALLY SHEET

Age Group	Primary Vaccinees	Age Group	Revaccinees
0-4	15 35	0-4	
5-14		5-14	
15+		15+	

TEAM NUMBER _____

PROVINCE _____

MED. DISTRICT _____

DATE _____

VACCINATION AREA _____

POPULATION

ESTIMATE _____

SMALLPOX VACCINE

LOT NUMBER _____

PAGE SUMMARY

	Primary vaccinees	Revaccinees	TOTAL
0-4			
5-14			
15+			
TOTAL			

SIGNATURES: RECORDER TEAM LEADER

Note: 1. Boxes by age group are roughly proportionate to population distribution in most endemic areas

2. If sex is to be recorded instead of vaccination status, males may be recorded on the left and females on the right

Field Assessment Report

Afghan Date	Province
Assessor(s)	Woleswali
Vacc: Date and Team	Village

Pockmarks with or
without vaccination
scar

P

V

x

✱

C

[illegible]

Take-rate: ~~1~~ 1 1 1

 $\ast + \odot$

P		
V		
&		
&		
All	(10)	(30)

(45)	(30)	(30)

All ob-
served

[illegible]

A blank grid for drawing a graph. The grid is 10 units wide and 10 units high. The horizontal axis (x-axis) is labeled from 0 to 10, and the vertical axis (y-axis) is labeled from 0 to 10. The grid lines are spaced at intervals of 1 unit.

All
Absent

Total

AFP No. :- 9
 Total House :- 77
 Population 589
 Vacc. PV 121 RV 404

SMALLPOX OUTBREAK FIELD FORM

STATE: BINAR

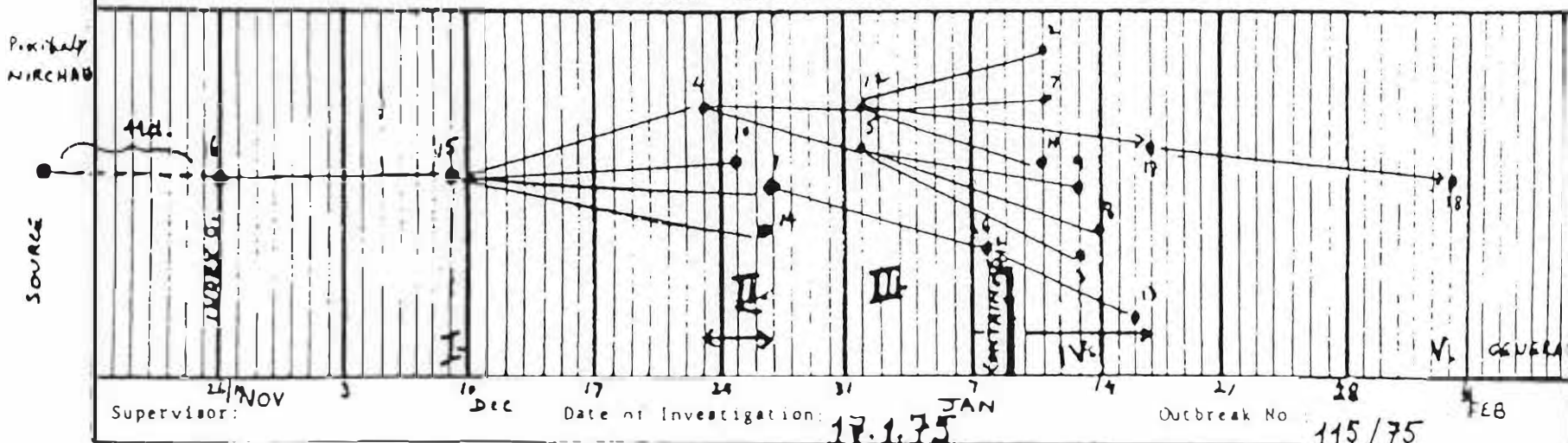
DISTRICT: AURANGABAD

PHC/BLOCK: NAYINAGAR

VILLAGE/TOWN: CHARAN

Case No.	Name	Age	Sex	Date of		Vaccination scar present		Case No.	Name	Age	Sex	Date of		Vaccination scar present	
				Onset of rash	Death	Yes	No					Onset of rash	Death	Yes	No
1	HARE RAM	5	M	26.12.74			✓	11	CHANDRATI	4	M	11.1.75	18.1.75		✓
2	GUAN	7	M	11.1.75			✓	12	HIBAHARI	9	F	1.1.75			✓
3	HANANTI	3	F	13.1.75			✓	13	PNUL MAIL	6	F	16.1.75	22.1.75		✓
4	SONA KUMARI	8	F	23.12.74			✓	14	PARAG	10	M	26.12.74			✓
5	GOBAL	5	M	1.1.75			✓	15	MALTI	5	F	26.11.74	2.2.75		✓
6	BINOD	3	M	8.1.75			✓	16	SHANTI	3	F	9.12.74			✓
7	PABRAH	1	M	11.1.75	15.1.75		✓	17	LACHUVA	46	F	17.1.75		✓	
8	RAMPYARI	10	F	14.1.75			✓	18	KAMAL	3	M	3.2.75			✓
9	HUSA KUMARI	2	F	13.1.75			✓								
10	MESHA KUMARI	5	F	25.12.74	1.1.75		✓								

DAILY GRAPH SHOWING CHAIN OF TRANSMISSION IN OUTBREAK



J.L. MAP

LOCALITY: SUTARPARA

16/15/DOHAR/5/236

SCALE: 8" = 1 MILE

GHATA JL-221

PADDY FIELD

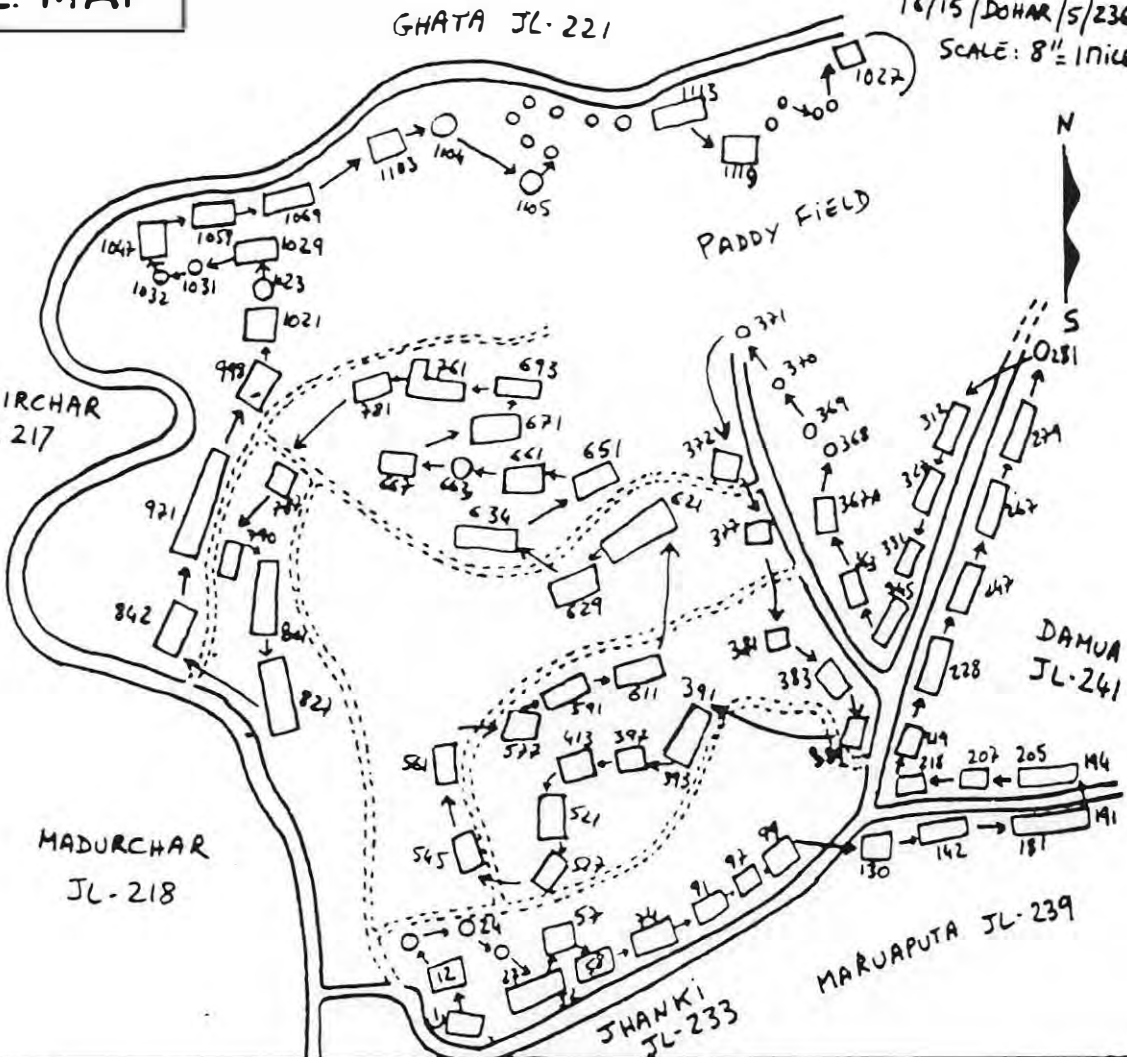
KAZIRCHAR
JL-217

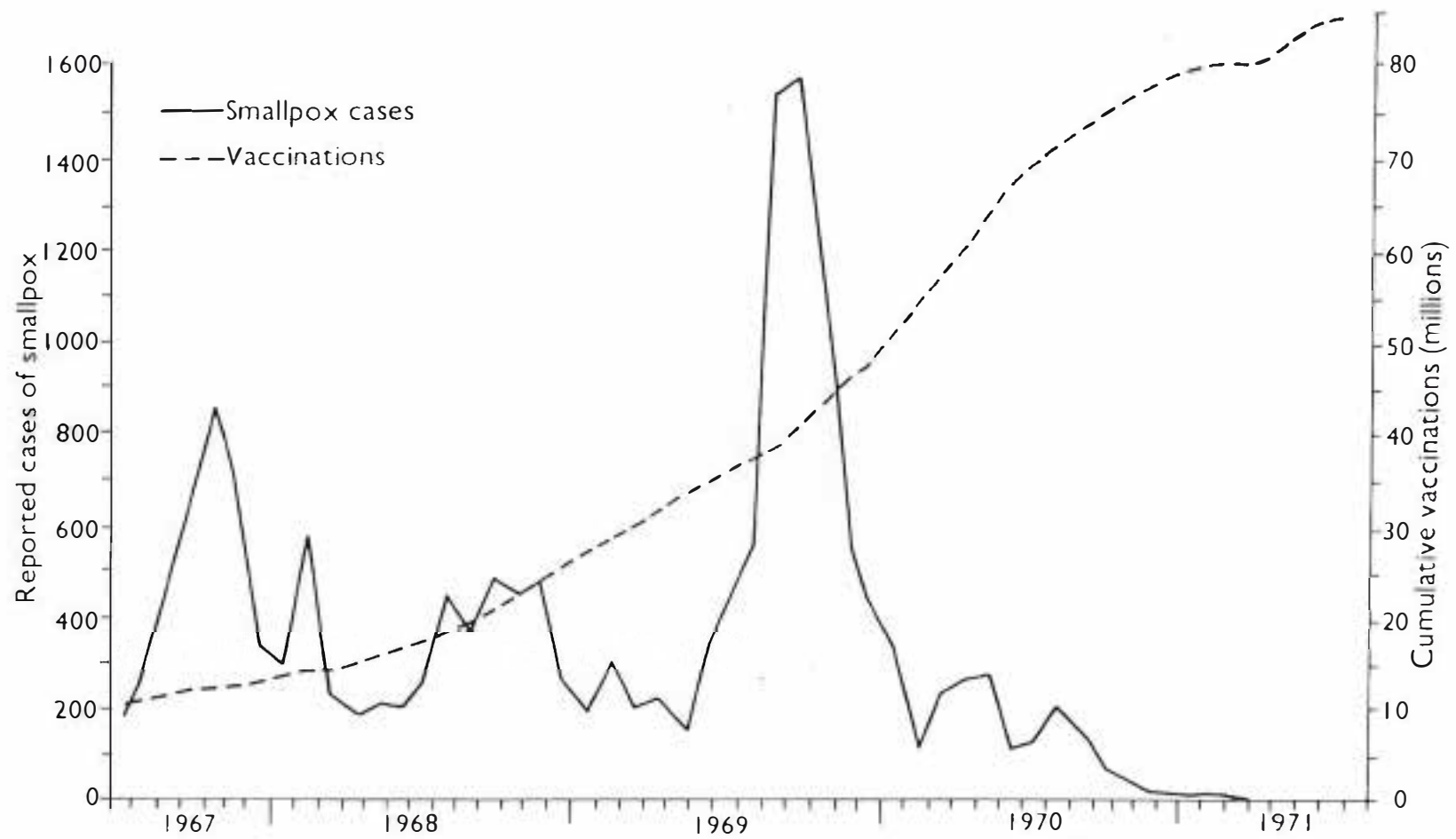
MADURCHAR
JL-218

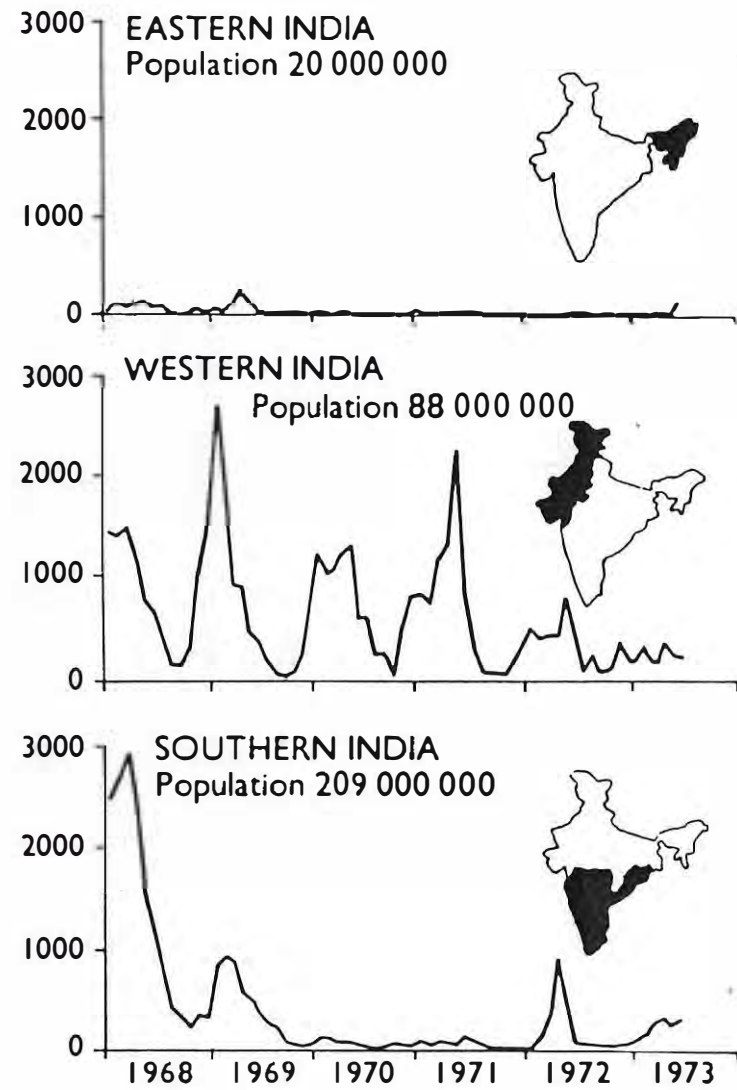
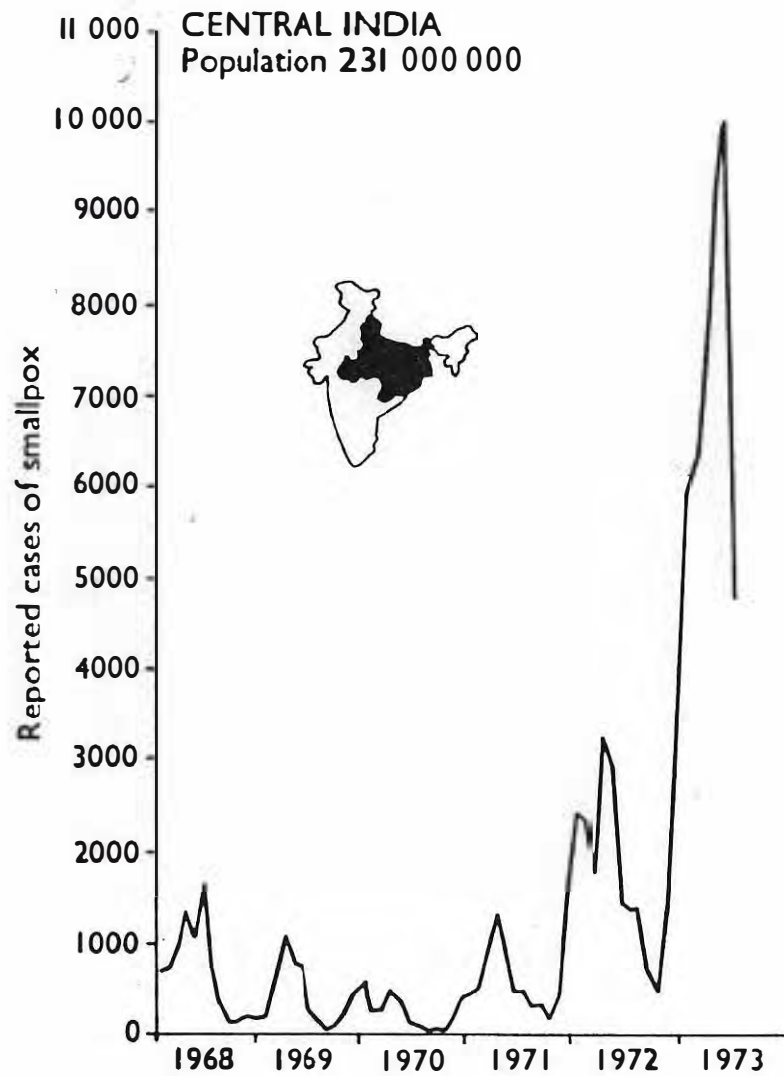
DAMUA
JL-241

MARUAPUTA JL-239

JHANKI
JL-233







SHEIKHUPURA DISTRICT -- PAKISTAN

May 1966-May 1967

Population: 1.2 million living in 1717 towns & villages

1040 smallpox cases in 121 outbreaks

only 20% officially reported

Findings of significance:

- 1. No outbreaks from May to Sept 1966**
- 2. Source of outbreaks - >50% from cities**
- 3. Transmitters of infection**

Disproportionately adult males

>90 % unimmunized

60 % traveled by train or bus