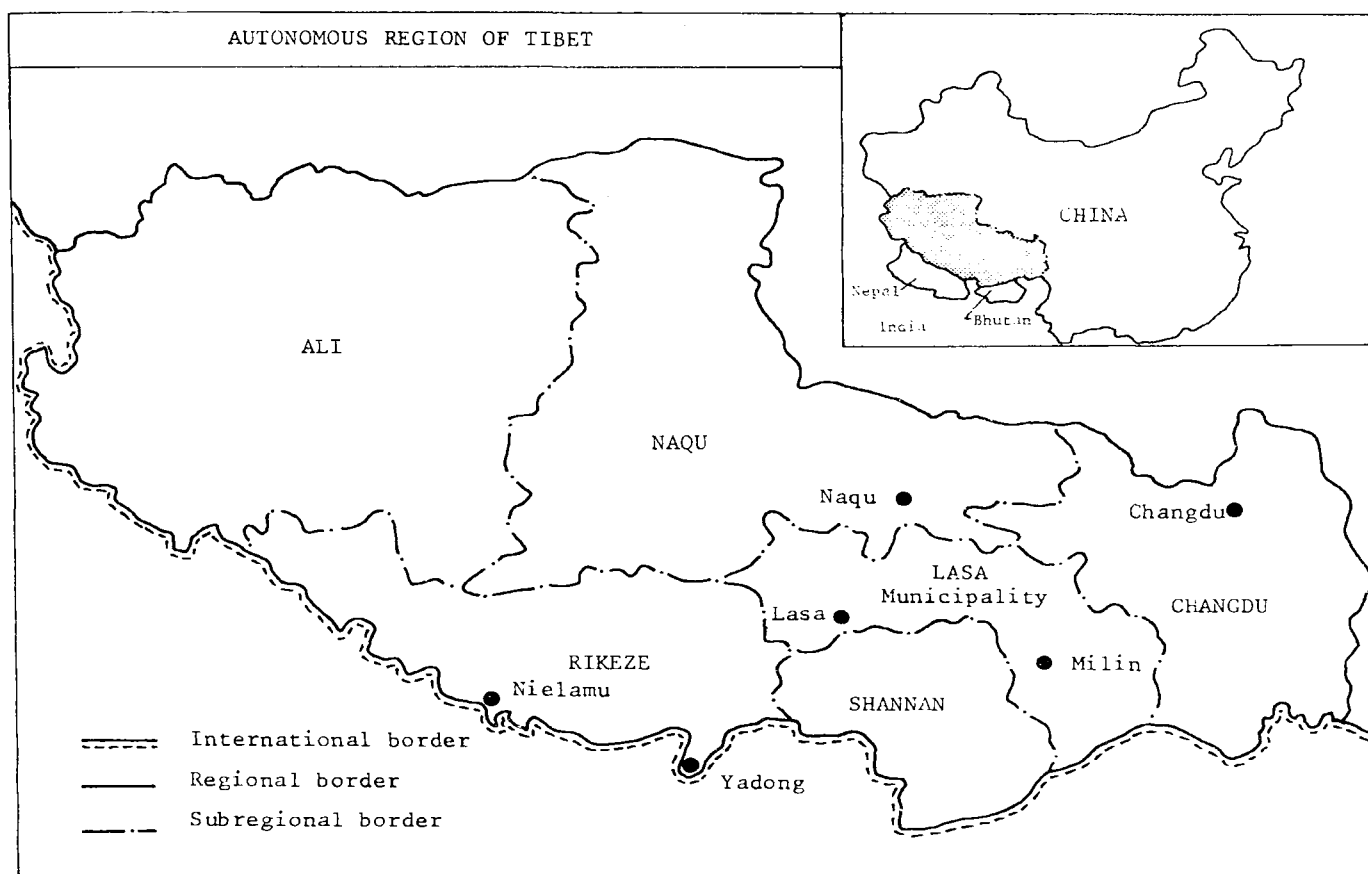




SMALLPOX ERADICATION IN THE AUTONOMOUS REGION OF TIBET
IN THE PEOPLE'S REPUBLIC OF CHINA¹

Including the results of pockmark and vaccination scar
surveys conducted in August 1979



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Introduction

The Autonomous Region of Tibet is located on the south-western part of the Tsinghai-Tibet plateau, bordering India, Nepal, Bhutan and Sikkim and covering an area of about 1 200 000 km². It is divided into five subregions, namely: Rikeze, Shannan, Changdu, Naqu and Ali. There are 71 counties and one municipality, Lasa. Tibetans constitute over 96% of the 1 790 000 population.

The Autonomous Region of Tibet was liberated in 1951 but had its democratic reform in 1959. Immediately after liberation, the Central People's Government organized several mobile medical teams to go to Tibet to assist the people in organizing general hospitals in Lasa, Changdu, Naqu and Rikeze. At present there are seven regional hospitals and eight subregional hospitals, including one Tibetan traditional medicine hospital. There is one Regional Epidemiological Station and one Quarantine Station, as well as an epidemiological station in each subregion. There is one medical college and seven middle level medical schools for the training of medical and public health personnel. Since 1974, the Ministry of Health has organized mobile medical teams, including 1800 persons, to help the local health personnel with medical and health activities.

Smallpox Morbidity and Eradication

According to the data supplied by the Regional Epidemiological Station, there were four epidemic waves of smallpox in Tibet from the beginning of this century: 1904-1909; 1924-1926; 1944-1947; 1949-1953.

The last of these began in Rikeze County of the Rikeze Subregion in June and July 1949, and spread over a period of three months to Jiangzhi, Nielamu, Dingri and Angren in the Rikeze Subregion; Naidong and Zhanang of the Shannan Subregion; and Changdu, Zuogong, Cha-on and Pomi of Changdu Subregion, as well as to Ali, Naqu and Lasa. Although no precise data about the actual incidence of smallpox are available, it is estimated that there were about 700 cases with 200 deaths in the three year period.

The numbers of cases of smallpox reported annually since 1954 are shown in table 1.

TABLE 1
REPORTED SMALLPOX CASES AND DEATHS, 1954-1960

Year	Sub-region	Number of cases	Number of deaths
1955	-	23	-
1956	Changdu	4	-
1960	Changdu	5	4
1960	Shannan	11	6

From 1960 on, three suspected smallpox outbreaks were reported. Investigation by the members of the Regional Epidemiological Station excluded the diagnosis of smallpox in each case. The details of these three outbreaks are shown in table 2.

TABLE 2
SUSPECTED CASES OF SMALLPOX IN TIBET, 1960-1979

Year of report	Source of report	Place of outbreak	Number of patients	Results of investigations
1963	Municipal hospital, Lasa	Bajiao street, Lasa	1	Male, aged 40, rash over the whole body and infected; after the crusts dropped off no pockmarks remained. Final diagnosis: secondarily infected chickenpox.
1965	Municipal hospital, Lasa	Duilong, Deqing County	3	All children, no deaths, no pockmarks after the crusts dropped off. Final diagnosis: chickenpox.
1970	Changdu subregion	Dingqing County	35	Both adults and children were attacked. The disease looked like chickenpox both epidemiologically and clinically. No pockmarks left after the crusts dropped off. The unvaccinated patients showed typical primary reaction after smallpox vaccination.

Vaccination against Smallpox

The vaccine used in Tibet was lyophilized by the Serum and Vaccine Institutes in Chengdu and Wuhan. The method and procedure of vaccination followed the regulations promulgated by the Ministry of Health. Some of the primary vaccinees were examined for take rates. The results are shown in table 3.

TABLE 3
PRIMARY SMALLPOX VACCINATION SUCCESS RATES, TIBET, 1964-1975

Year	Month	Type of vaccine	Place of examination	Number of vaccinees examined	Number with positive "take"	"Take rate" (%)
1964	March	Calf lymph, liquid	Lasa city	16	14	87.5
1964	March	Calf lymph, liquid	Nielamu	41	39	95.1
1965	December	Lyophilized calf lymph	Anduo	67	60	89.5
1973	November	Lyophilized calf lymph	Qushui	72	70	97.2
1975	April	Calf lymph, liquid	Luozha	93	88	94.6

The antibody status following vaccination was examined in several groups of people in various years and is shown in table 4.

TABLE 4
ORTHOPOXVIRUS ANTIBODIES IN SELECTED POPULATIONS, TIBET, 1964-1977

Year	Place	Type of people	After primary vaccination and revaccination			Revaccinated people only		
			Number examined	Number with antibody	% with antibody	Number examined	Number with antibody	% with antibody
1964	Lasa	Children	297	245	82.5	281	245	87.2
1965	Anduo	Herdsmen	148	69	46.6	81	69	85.2
1973	Qushui	Farmers	638	548	85.9	566	534	94.3
1973	Naidong	Farmers	636	561	88.2	-	-	-
		Pupils						
		Herdsmen						
1974	Zuomei	Farmers	629	341	54.2	-	-	-
		Pupils						
1975	Luozha	-	1 448	1 246	86.0	-	-	-
1975	Zuona	-	382	271	70.9	-	-	-
1977	Zedang	-	684	669	97.8	-	-	-
	(town)							
1977	Naidong	Farmers	557	397	71.3	-	-	-

To increase the immunity level of the population living in the border regions, a mass vaccination campaign was conducted in 1964 in Nielamu County and in neighbouring Dingri County. More than 90% of the population were vaccinated. In 1975, another such campaign was conducted in the border areas of 18 counties adjacent to Nepal and India and in two centres of communication between these two countries and China.

Conclusion

The main factors contributing to the eradication of smallpox in Tibet were:

1. the mass vaccination campaigns conducted in 1964 and 1975;
2. the sparse population; and
3. the reinforcement of the surveillance and quarantine systems since the early 1960's.

No new cases of smallpox have been reported since 1960.

Vaccination Scar and Pockmark Survey, 1979

In August 1979, using a process of random selection, examinations for vaccination scars and pockmarks were performed among the people of various age groups in two subregions and one municipality: Shannan Subregion, an agricultural area neighbouring India and Bhutan; Rikeze Subregion, an agricultural and pastoral area neighbouring Bhutan, Sikkim, India and Nepal; and Lasa city. The results of the examination are shown in tables 5, 6 and 7. Vaccination coverage was found to be generally high although somewhat lower in the 0-4 years age group than in the older age groups. No pockmarked person of less than 20 years of age was detected.

TABLE 5
RESULTS OF VACCINATION SCAR AND POCKMARK SURVEY, TIBET, AUGUST 1979

Area	Number of institutions visited	Number of persons examined	Number of persons with vaccination scars	Rate %	Number of persons with pockmarks	Rate %
Lasa city	42	7 116	6 218	87.4	50	0.7
Rikeze	18	7 257	6 385	88.0	75	1.03
Shannan	4	1 288	1 269	98.5	0	0
Total	64	15 661	13 872	88.6	125	0.8

TABLE 6
AGE SPECIFIC VACCINATION SCAR AND POCKMARK RATES, TIBET, AUGUST 1979

Age group (years)	Number examined	Number with vaccination scars	Rate %	Number with pockmarks	Rate %
0-4	1 231	708	57.5	0	0
5-19	8 715	7 944	91.1	0	0
20+	5 715	5 220	91.3	125	2.19
All ages	15 661	13 872	88.6	125	0.8

TABLE 7
AGE SPECIFIC VACCINATION SCAR RATES BY AREA, TIBET, AUGUST 1979

Area	Age group (years)	Number examined	Number with vaccination scars	Rate %
Lasa city	0-4	357	177	68.9
	5-19	3 947	3 437	87.1
	20+	2 912	2 604	89.4
Subtotal	All ages	7 116	6 218	87.4
Rikeze Subregion	0-4	860	425	49.4
	5-19	3 719	3 467	93.2
	20+	2 678	2 493	93.1
Subtotal	All ages	7 257	6 385	88.0
Shannan Subregion	0-4	114	106	93.0
	5-19	1 049	1 040	99.1
	20+	125	123	98.4
Subtotal	All ages	1 288	1 269	98.5

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