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Leprosy in China: delay in the detection of cases

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In a national survey in China, 27 928 cases of leprosy detected by the health authorities between 1984 and 1998 were investigated. The delay between onset of symptoms (estimated from each case's recall) and confirmed diagnosis was ≤ 2 years for 55.1% of the new patients but > 10 years for 7.0%, with a median value, overall, of 22.0 months. The median delay was longer: (1) for the multibacillary cases than the paucibacillary; (2) among farmers than among factory workers; (3) among some nationalities than among others (being longest among the Tu and shortest among the Wei); and (4) for some methods of case-detection than for others. Over the study period, the mean delay decreased with time. The delay was greatest in the areas where leprosy was endemic and/or where access to health services was poor. The later the cases were detected the more likely they were to show disability.

Leprosy cases are still going undetected in China, although, over the last 14 years, case-finding has significantly improved. Age, occupation, nationality, leprosy type and detection method all appear to affect the delay.

A national programme of leprosy control was initiated in China in the mid-1950s, by the Ministry of Health. It began as a vertical strategy, with the National Centre for STD and Leprosy Control at the top, supervising institutions specialising in skin-disease control at the lower, provincial and county levels. In recent years, however, it has gradually been integrated into a system of primary health care. This change was facilitated, in the 1980s, by the implementation of multi-drug therapy (MDT), with dapsone, rifampicine and clofazimine. This brought about a rapid reduction in the incidence of the disease. As the control programme became more horizontal, the methods used for case-detection also changed, although it is unclear how these changes have affected the speed of detection.

If leprosy is to be effectively controlled, and

perhaps even eradicated, those suffering from the disease must be detected and treated as soon as possible. Early detection of cases is also important in reducing leprosy-attributable disability (Schreuder, 1998a; Meima *et al.*, 1999). Measurement of the duration of disease prior to detection of the case by the health authorities is therefore a useful and highly relevant indicator of the quality of any leprosy-control programme. Although Becx-Bleumink (1993), Schreuder (1998a) and Meima *et al.* (1999) all investigated this delay in the detection of cases, there have been few comprehensive studies in which the relationships, if any, between the delay and epidemiological, clinical and operational factors have been investigated on a large-scale. The aim of the present, retrospective study was to see how the delay in case-detection had changed in China since 1984 and how it could be related to clinical and operational parameters.

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SUBJECTS AND METHODS

The relevant demographic, epidemiological and clinical data were obtained from the National System for Leprosy Recording and Reporting. This is an annual, population-based project initiated by the Ministry of Health of China, implemented under field-programme conditions, and supervised by the National Centre for STD and Leprosy Control (NCSTDLC). (The national database for all the leprosy cases detected since the 1950s has been established in the NCSTDLC.) The records for the 27 928 cases who were detected between 1984 and 1998 and for whom complete data were available were analysed.

Delay in detection was based upon patient recall and defined as the duration of disease before confirmed diagnosis (i.e. the time between the case being aware of the first symptom and confirmed diagnosis of leprosy). When a case could remember the year of their first symptom but not the month, the symptom was assumed to have begun at the end of June.

For statistical analysis, the Kruskal-Wallis test was used for overall comparisons of more than two non-parametric variables, the Mann-Whitney test was applied to compare two non-parametric variables, and χ^2 tests were used to determine the significance of differences between categorized data and of trends. A *P*-value of < 0.05 was considered to be statistically significant. Each analysis was carried out using commercial statistical software

(SPSS version 8.0 for Windows; SPSS Inc., Chicago, IL).

RESULTS

Most (66.8%) of the 27 928 subjects reported voluntarily to the health authorities, and 20 512 (73.4%) were males. Only 3.7% were children (i.e. aged < 15 years), the mean (s.d.) age at detection being 37.4 (15.1) years. Only 31.1% of the cases—28.0% of the multibacillary (MB) and 37.0% of the paucibacillary (PB)—had been diagnosed within 1 year of the onset of symptoms, and 55.1% (52.8% of the MB and 59.4% of the PB) had experienced their first symptoms ≤ 2 years before diagnosis. Delay times exceeded 10 years for 7.0% of the cases (6.4% of the MB *v.* 8.0% of the PB; $\chi^2 = 24.1$; $P < 0.001$), less commonly among males (6.9%) than among females (7.1%; $\chi^2 = 0.4$; $P > 0.05$). As the distribution of the delays was found to be strongly (positively) skewed, median values were determined, not means. The overall median delay was 22.0 months. The median delay was higher among adults than in children, significantly increasing with age in both males and females (Tables 1 and 2). After stratification by age, the only significant difference in the delay experienced by males and females was found to be in those aged 25–34 years (21.0 months for males *v.* 24.0 months for females); overall, there was no significant

TABLE 1
Median delays in the detection of leprosy cases, categorized by type of disease and sex

Type of disease	Male cases		Female cases		Z	P	All cases	
	No.	Delay (months)	No.	Delay (months)			No.	Delay (months)
Multibacillary (MB)	13 718	23.0	4461	24.0	1.11	> 0.05	18 179	24.0
Paucibacillary (PB)	6794	19.0*	2955	18.0*	1.93	> 0.05	9749	19.0*
MB or PB	20 512	22.0	7416	22.0	1.16	> 0.05	27 928	22.0

* Significantly shorter delays than for the MB, with Z-values of 9.75, 8.75 and 12.95 for the males, the females and all of the cases, respectively ($P < 0.01$ for each).

TABLE 2
Median delays in the detection of leprosy cases, categorized by age and sex

Age of case at diagnosis (years)	Male cases		Female cases		Z	P	All cases	
	No.	Delay* (months)	No.	Delay* (months)			No.	Delay* (months)
< 15	647	11.0	398	12.0	0.58	> 0.05	1045	11.0
15-24	3344	17.0	1582	19.0	0.17	> 0.05	4926	18.0
25-34	5541	21.0	1877	24.0	2.45	< 0.05	7418	22.0
35-44	4731	24.0	1417	23.0	0.11	> 0.05	6148	24.0
45-54	3069	26.0	1034	26.0	0.60	> 0.05	4103	26.0
55-64	2066	27.0	668	26.0	0.28	> 0.05	2734	26.0
≥ 65	1114	25.0	440	24.0	0.02	> 0.05	1554	25.0

* Kruskal-Wallis tests gave χ^2 values of 684.4, 299.8 and 980.5 for the males, the females and all of the cases, respectively ($P < 0.01$ for each).

TABLE 3
Median delays in the detection of leprosy cases, categorized by occupation

Occupation	Code	Cases		Delay* (months)	P-value for difference between occupations			
		No.	(%)		J2	J3	J4	J5
Farmer	J1	24 614	(88.14)	23.0	< 0.01	> 0.05	< 0.01	< 0.01
Factory worker	J2	962	(3.44)	19.0		> 0.05	< 0.01	< 0.01
Office worker	J3	634	(2.27)	22.0			< 0.01	< 0.01
Student	J4	607	(2.17)	12.0				< 0.05
Child	J5	402	(1.44)	10.0				
Others	J6	709	(2.54)	22.0				

* Kruskal-Wallis test gave a χ^2 value of 418.0 ($P < 0.01$).

difference in the delays experienced by males and females (Table 1).

The median delay of 19.0 months among the PB cases was significantly shorter than the 24.0 months recorded among the MB. Although the delays for students and children were significantly shorter than those for farmers, factory workers or office workers, the differences may relate to age rather than occupation (Table 3). However, the delay among farmers was statistically significantly greater than that among factory workers. There were also differences in the median delays for the various nationalities represented, that for the Tu being significantly greater than those for the others, and that for the Wei, Tai and

Zhuang being significantly shorter than the others (Table 4).

When median delays were determined for 2-year periods spanning the study period, it became clear that the values had decreased significantly, from 35 months in 1984-1986 to 19 months in 1996-1998 (Table 5). The most dramatic reduction in the delays occurred in 1984-1989. Statistically significant differences in the magnitudes of delay were found among the methods employed for case-detection, for both male and female cases (Table 6). Contact examination or notification by skin clinics generally led to earlier case-finding than, for example, clue surveys.

The delay in detection was greatest in the

TABLE 5
Median delays in the detection of leprosy cases, categorized by sex and date of diagnosis

Date of diagnosis	Male cases		Female cases		Z	P	All cases	
	No.	Delay* (months)	No.	Delay* (months)			No.	Delay* (months)
1984-1986	2297	36.0	714	33.0	1.93	>0.05	3011	35.0
1987-1989	5454	23.0	1897	24.0	1.82	>0.05	7351	24.0
1990-1992	5748	21.0	2072	20.0	1.27	>0.05	7820	21.0
1993-1995	3768	19.0	1423	20.0	1.65	>0.05	5191	19.0
1996-1998	3245	19.0	1310	18.0	2.06	<0.05	4555	19.0

* Kruskal-Wallis tests gave χ^2 values of 502.8, 140.2 and 628.2 for the males, the females and all of the cases, respectively ($P < 0.01$ for each).

TABLE 6
Median delays in the detection of leprosy cases, categorized by mode of detection

Mode of detection	Male cases		Female cases		Z	P	All cases	
	No.	Delay* (months)	No.	Delay* (months)			No.	Delay* (months)
Self-reporting	6506	23.0	2014	24.0	0.68	>0.05	8520	23.0
Notification	7420	18.0	2710	18.0	0.44	>0.05	10130	18.0
Contact examination	1401	15.0	750	14.0	0.71	>0.05	2151	15.0
Cluc survey	4536	30.0	1653	29.0	1.05	>0.05	6189	30.0
Screening	547	24.0	239	26.0	1.11	>0.05	786	25.0
Other	102	18.5	50	25.0	1.82	>0.05	152	23.5

* Kruskal-Wallis tests gave χ^2 values of 787.3, 309.5 and 1091.4 for the males, the females and all of the cases, respectively ($P < 0.01$ for each).

areas where leprosy was endemic and/or access to health services was poor (Table 7). When diagnosed, more than 26% of the cases had disabilities which would be graded II on the World Health Organization's scale (WHO, 1988). The proportion of cases with such disability significantly increased with increasing delay in detection (Table 8).

DISCUSSION

Delay in the detection or registration of cases is a common feature of programmes for the control of various chronic diseases, including leprosy. This delay is difficult to measure

accurately, since researchers must usually rely on the memory of the case as to when the disease became symptomatic (Li *et al.*, 1995; Bekri *et al.*, 1998; Schreuder, 1998a). As with leprosy, the first symptoms may have occurred many months or even years before the case is asked about them and their disease is diagnosed. However, provided the relevant data are collected in a consistent manner throughout the study period (as in the present study), useful comparisons and analyses can still be made.

The introduction of MDT into China in the mid-1980s, and its subsequent, good implementation nationwide, led to a largely effective leprosy-control programme. As the

TABLE 7

Median delays in detection of leprosy cases, categorized by leprosy endemicity and ease of access to health services

	Endemic area?				Access to health services			
	Yes	No	Z	P	Good	Poor	Z	P
No. of cases	14 857	13 071			5965	21 963	-	
Delay (months)	23.0	21.0	9.47	<0.01	15.0	24.0	27.66	<0.01

TABLE 8

Relationship between delay in detection of leprosy and level of leprosy-attributable disability at diagnosis

Delay (years)	No. of cases with:			No. of cases	% of cases disabled*	Odds ratio
	No disability	Grade-I disability	Grade-II disability			
≤ 1.0	5494	1048	938	7480	12.5	1.00
1.0-2.9	6940	1962	2398	11300	21.2	1.99
3.0-4.9	1881	746	1447	4074	35.5	3.84
≥ 5.0	1770	795	2509	5074	49.4	6.82
Any	16 085	4551	7292	27 928	26.1	-

* A χ^2 value of 2433.2 indicated that there was a significant, linear trend ($P < 0.001$).

incidence of the disease falls, the early detection of the remaining cases becomes increasingly important. In the present study, the median delay between the patients' observation of the first signs of the disease and the time of detection (confirmed diagnosis) of leprosy was a disappointing 22.0 months (24.0 and 19.0 months for MB and PB patients, respectively). Although this period is shorter than those reported by Becx-Bleumink (1993) and Schreuder (1998a), it means that many cases remain undetected in Chinese communities.

There were no significant differences in the delays experienced by male and female cases, except among those aged 25-34 years, where males were detected significantly earlier than females. As men aged 25-34 years who live in rural areas spend much longer working outdoors than their female counterparts, perhaps they are more accessible to the medical services. A difference in accessibility may also explain why leprosy is detected earlier in farmers than in factory workers. The earlier detection of the disease in children and students than in other occupations is probably a

result of the differences in the ages of the occupational groups; the older the case is the longer the possible delay (Li *et al.*, 1995; Meima *et al.*, 1997). Thus, the median delay apparently increased with age.

PB cases were diagnosed significantly earlier than MB patients. Becx-Bleumink (1993) made the same observation in Ethiopia but Schreuder (1998a) found that, in Thailand, MB cases were diagnosed earlier than the PB cases, although the difference was not significant.

The reduction in the median delay with time—especially in 1984-1989, when use of MDT began in China—is encouraging and indicative of the value of MDT. Even in 1996-1998, however, 38.5% and 12.2% of the new cases diagnosed had been symptomatic for >2 and >5 years, respectively, although these values are similar to those reported in some other regions (Meima *et al.*, 1997).

The early detection of leprosy in China does not depend upon active case-detection: two-thirds of the cases investigated in the present study had reported voluntarily to the health authorities. It is clear, however, that

some methods of case-detection, particularly contact examination, are better at detecting early cases than others (Table 6). Notification of cases through skin clinics is also a good method of case-finding, which not only detects cases relatively soon after they have become symptomatic (Table 6) but also before most have developed grade-II disability. [Cases detected by all other methods, except contact examination, are more likely to show this level of disability at diagnosis (unpubl. obs.).] In addition, notification by skin clinics might also be the most cost-effective way of detecting cases in China in the future, as leprosy stops being a major public-health problem and it becomes harder to justify systems dedicated to its detection.

Curiously, cases in non-endemic areas were detected earlier than those in endemic areas ($P < 0.001$). This result probably reflects differences in socio-economic development: in general, the endemic areas are less developed and poorer than the non-endemic, with poorer and less accessible systems of healthcare. As might be expected, the less accessible the health service, the greater the delay in detection.

The predominance of the Han in China and among the present cases limits the significance of the analysis of the delays experienced by each nationality. However, the relatively long delays among the Tu nationality and the short delays among, in particular, the Wei were statistically significant. The reasons for these differences are not clear, but probably relate to ethnic differences in socio-economic and cultural status, accessibility to health care and other characteristics which differ with nationality, such as the level of exposure of the body.

The proportion of cases with grade-II disability has been considered a rough indicator of the quality of case-detection activities. The positive association between the presence of such disability and delay in detection (diag-

nosis) found in the present study has been observed in many studies from various regions (Noordeen and Srinivasan, 1966; Ponnighaus *et al.*, 1990; Schreuder, 1998b; Meima *et al.*, 1999). In China, as in northern Thailand (Smith and Richardus, 1993), the mean age at detection has increased but the duration of disease pre-diagnosis has decreased over the years. These two trends have opposite effects on the frequency of disability: the older a case is when diagnosed the more likely he or she is to have grade-II disability, but the sooner the disease is diagnosed the less likely the case is to be showing this level of disability. However, in terms of disability, the duration of disease is more important than the age of the case (Noordeen and Srinivasan, 1966).

Although the proportion of the present cases having disability of grades II or III (26.1%) is comparable with that observed in some studies (Wittenhorst *et al.*, 1998; Meima *et al.*, 1999), it is still much higher than recorded in many others (Schreuder, 1998b; Croft *et al.*, 1999), indicating that the Chinese cases were not detected as early as would be desirable.

In conclusion, the present study has provided a preliminary view of the delays in case-detection in China and of the factors affecting the delays. A better understanding of these issues will be of eminent importance in developing strategies for control of the remaining leprosy in China.

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REFERENCES

- BECK-BLEUMINK, M. (1993). Priorities for the future and prospects for leprosy control. *International Journal of Leprosy*, **61**, 82-101.

- BEKRI, W., GEBRE, S., MENGISTE, A., SAUNDERSON, P. R. & ZEWGE, S. (1998). Delay in presentation and start of treatment in leprosy patients: a case-control study of disabled and non-disabled patients in three different settings in Ethiopia. *International Journal of Leprosy*, **66**, 1-9.
- CROFT, R. P., RICHARDUS, J. H., NICHOLLS, P. G. & SMITH, W. C. (1999). Nerve function impairment in leprosy: design, methodology, and intake status of a respective cohort study of 2664 new leprosy cases in Bangladesh (the Bangladesh acute nerve damage study). *Leprosy Review*, **70**, 140-159.
- LI, H. Y., WANG, X. M., LI, T., ZHENG, D. Y., MAO, Z. M., RAN, S. P. & LIU, F. W. (1995). Long-term effect of leprosy control in two prefectures of China, 1955-1993. *International Journal of Leprosy*, **63**, 213-221.
- MEIMA, A., GUPTA, M. D., VAN OORTMARSEN, G. J. & HABBEMA, J. D. F. (1997). Trends in leprosy case detection rates. *International Journal of Leprosy*, **65**, 305-319.
- MEIMA, A., SAUNDERSON, P. R., GEBRE, S., DESTA, K., VAN OORTMARSEN, G. J. & HABBEMA, J. D. F. (1999). Factors associated with impairments in new leprosy patients: the AMPES cohort. *Leprosy Review*, **70**, 189-203.
- NOORDEEN, S. K. & SRINIVASAN, H. (1966). Epidemiology of disability in leprosy. 1. A general study of disability among male leprosy patients above fifteen years of age. *International Journal of Leprosy*, **34**, 159-169.
- PONNIGHAUS, I. M., BOERRIGTER, G., FINE, P. E. M., PONNIGHAUS, J. M. & RUSSELL, J. (1990). Disabilities in leprosy patients ascertained in a total population survey in Karonga District, northern Malawi. *Leprosy Review*, **61**, 366-374.
- SCHREUDER, P. A. M. (1998a). The occurrence of reactions and impairments in leprosy: experience in the leprosy control program of three provinces in northeastern Thailand, 1978-1995. I. Overview of the study. *International Journal of Leprosy*, **66**, 149-158.
- SCHREUDER, P. A. M. (1998b). The occurrence of reactions and impairments in leprosy: experience in the leprosy control program of three provinces in northeastern Thailand, 1978-1995. III. Neural and other impairments. *International Journal of Leprosy*, **66**, 170-181.
- SMITH, T. C. & RICHARDUS, J. H. (1993). Leprosy trends in northern Thailand: 1951-1990. *Southeast Asian Journal of Tropical Medicine and Public Health*, **24**, 3-10.
- WITTENHORST, B., VREE, M. L., TEN HAM, P. B. G. & VELEMA, J. P. (1998). The National Leprosy Control Programme of Zimbabwe: a data analysis, 1983-1992. *Leprosy Review*, **69**, 46-56.
- WORLD HEALTH ORGANIZATION (1988). *WHO Expert Committee on Leprosy*. Technical Report Series No. 768. Geneva: WHO.