TRENDS OF CASE DETECTION AND PREVALENCE OF LEPROSY IN VIETNAM SINCE 1983

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ABSTRACT

Background: Leprosy is one of oldest diseases in recorded history caused by *Mycobacterium leprae*. The disease mainly affects the skin, the peripheral nerves and it can cause disability if left untreated. Leprosy was common in many countries, especially those with tropical or subtropical climates. However, with the implementation of Multi Drug Therapy (MDT), leprosy is becoming very rare disease in several countries in the world.

Vietnam has seen a highly significant decrease in the prevalence rate (PR) of leprosy since the introduction of multidrug therapy (MDT) in 1983. It is clear that over the past 35 years, the profile of leprosy in Vietnam has been changed significantly.

Objective: This study was conducted to present and to analize the trends in case detection and prevalence of leprosy in Vietnam from 1983 to 2018.

Method: Individual records and annual reports were collected to analyze information of the prevalence of registered cases, the numbers of new cases detected yearly, their sex, age, classification and disability status.

Results: Prevalence rate has dropped significantly from 6.78 per 10,000 population in 1983 to 0.01 per 10,000 in 2018. While the case detectionrate (CDR) has shown a smaller fall, from 3.74 per 100,000 population in 1983 to 0.10 per 100,000 in 2018. The proportion of grade 2 disability among new cases from 1983 to 2018 fluctuated a lot depending on the trend in case detection.

Conclusion: With the introduction of MDT in 1983, the epidemiology of leprosy in Vietnam has dramatically improved with the prevalence rate declined significantly and majority of the patients are now able to lead normal lives in the community without being stigmatized and discriminated.

Keywords: *leprosy, multidrug therapy, disability, prevalence rate, detection rate.*

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1. INTRODUCTION

Leprosy is one of oldest diseases in recorded history caused by *Mycobacterium leprae*. The disease mainly affects the skin, the peripheral nerves and it can cause disability if left untreated. Leprosy was common in many countries, especially those with tropical or subtropical climates. However, with the implementation of Multi Drug Therapy (MDT), leprosy is becoming very rare disease in several countries in the world.

In Viet nam, leprosy was a major public health problem. In the past, many patients were ostracized by their communities as the disease was considered incurable, disfiguring and wrongly thought to be highly infections. Due to the strong stigma attached to this disease, patients who have successfully completed treatment and have been cured were found to be leading a segregated life. Some of them are being congregated in places such as leprosy villages/colonies where persons affected by leprosy (PALs) facing similar social problems have been staying for a long time.

In order to change the situation of the disease, in 1982 the national leprosy control program (NLCP) was established and MDT was implemented one year later (1983). It has to be admitted that since the introduction of MDT, there has been a remarkable improvement in the epidemiology with MDT making an enormous effect upon the program of controlling the disease. As a result, Vietnam has achieved the elimination target at the national level in 1995 with the prevalence rate of 0.7 per 10,000 population. Since then the prevalence rate continued to decrease at all provinces. At the end of the year 2000, the sub-national target has been reached. Partially, the new case detection rate has declined (1,2).

It is clear that over the past 35 years, the profile of leprosy in Vietnam has been changed significantly.

This study was conducted to present and to analyze the trends of case detection and prevalence of leprosy in Vietnam since 1983.

2. MATERIALS AND METHODS

New cases were detected through voluntary reporting, mass survey and contact examination. A diagnosis of leprosy was made of a person with definite loss of sensation in a pale or reddish skin patch or a thickened peripheral nerve with loss of sensation and/or weakness of the muscles supplied by that nerve or the preserve of acid – fast bacilli in a split skin smear. The bacterial study was judged as positive if in 100 oil - immersion fields there was one or more Mycobacterium leprae bacilli and the bacterial index (BI) was 1+ or greater on the Riddley scale [1,2]. All patients with positive skin smear were classified as multibacillary (MB) whatever the number of the skin lesion. Those with negative skin smear, the classification was decided by the number of skin lesion: Paucibacillary (PB) if cases have up to five skin lesions and MB if cases have six or more skin lesions (2).

All were treated and followed by the health worker. The supervisions for every 3 months were carried out by the dermatologists.

Individual records and annual reports were analyzed to collect information on the prevalence of registered cases, the number of new cases detected yearly, their sex, age, classification, and disability status.

The prevalence rate was expressed as the number of the registered patient at the end of the year per 10,000 population. New case detected

rate was expressed as the number of new cases detected during the year per 100,000 population.

3. RESULTS AND DISCUSSION

3.1. Trend in prevalence of leprosy

Table 1 shows a decreasing trends in the absolute numbers and rates of registered prevalence cases at the end of each year as well as the annual newly detected cases from 1983 to 2018. As a result of the efforts undertaken by the national program, Vietnam reached the goal of elimination at the national level in 1995 reporting a prevalence rate of 0.70 per 10,000 population.

In order to promote community awareness and to increase case-finding activities in some selected parts of the country, several special projects were carried out such as health educational campaigns, special action project for elimination of leprosy (SAPEL), leprosy elimination campaign (LECs) and mini-LECs. As shown in table 2, these activities were conducted during the years 1991 to 1997.

Table 1. Prevalence and case detection in Vietnam, 1983-2018

Year	Prevalence		Cases detected	
	n	Per 10,000	n	Per 100,000
1983	38,652	6.78	2,021	3.74
1984	36,226	6.14	2,103	3.77
1985	32,483	5.36	2,062	3.59
1986	29,219	4.79	2,292	3.88
1987	27,401	4.42	2,183	3.61
1988	24,570	3.90	1,847	2.98
1989	23,612	3.69	2,073	3.26
1990	24,081	3.65	1,995	3.47
1991	18,418	2.71	2,500	3.69
1992	9,245	1.36	3,142	4.53
1993	7,090	1.01	3,185	4.38
1994	7,104	1.00	3,173	4.29
1995	5,277	0.70	2,591	3.45
1996	4,827	0.68	2,883	3.83
1997	4,665	0.61	2,808	3.65
1998	3,482	0.44	2,162	2.74
1999	2,087	0.27	1,795	2.35
2000	1,718	0.23	1,477	1.94
2001	1,532	0.2	1,336	1.73
2002	1,269	0.16	1,158	1.44
2003	1,204	0.15	949	1.18
2004	828	0.1	858	1.04

Year	Prevalence		Cases detected	
	n	Per 10,000	n	Per 100,000
2005	642	0.1	746	0.9
2006	572	0.1	666	0.75
2007	510	0.1	552	0.66
2008	540	0.1	530	0.62
2009	350	0.04	413	0.48
2010	318	0.04	359	0.41
2011	322	0.04	374	0.43
2012	265	0.03	296	0.34
2013	260	0.02	294	0.29
2014	187	0.02	227	0.2
2015	178	0.02	168	0.19
2016	138	0.02	153	0.15
2017	109	0.01	112	0.12
2018	96	0.01	77	0.1

Table 2. Special projects implemented from 1991-1997

Project	Number	Population covered	Number of new cases detected
LEC	8	1,100,200	603
SAPEL	6	872,000	154
Others	18	1,030,000	663
Total	32	3,002,200	1,420

During the nineteen eighties the caseload in terms of registered prevalence was very high in the country. This was mainly due to re-registration of a large number of patients who were previously treated with dapsone. These patients were again treated with MDT. Moreover, during this period, MB patients were treated for a period of 24 months or until the bacteriological index (BI) became negative. This explains why the prevalence rate from 1983 to 1991 was very high in the country. However, starting from 1992, the number of registered cases declined dramatically. The rapid reduction in prevalence was due to factors such as: increase MDT coverage in the whole country which quickly cleared up the backlog cases, following a standard case definition for treatment and improving registration practices (removing from the treatment registers patients who have completed treatment, dead, migrated and defaulted). The prevalence rate continued to decline remarkably after the introduction of 12 months fixed-duration treatment in 1998 for MB patients.
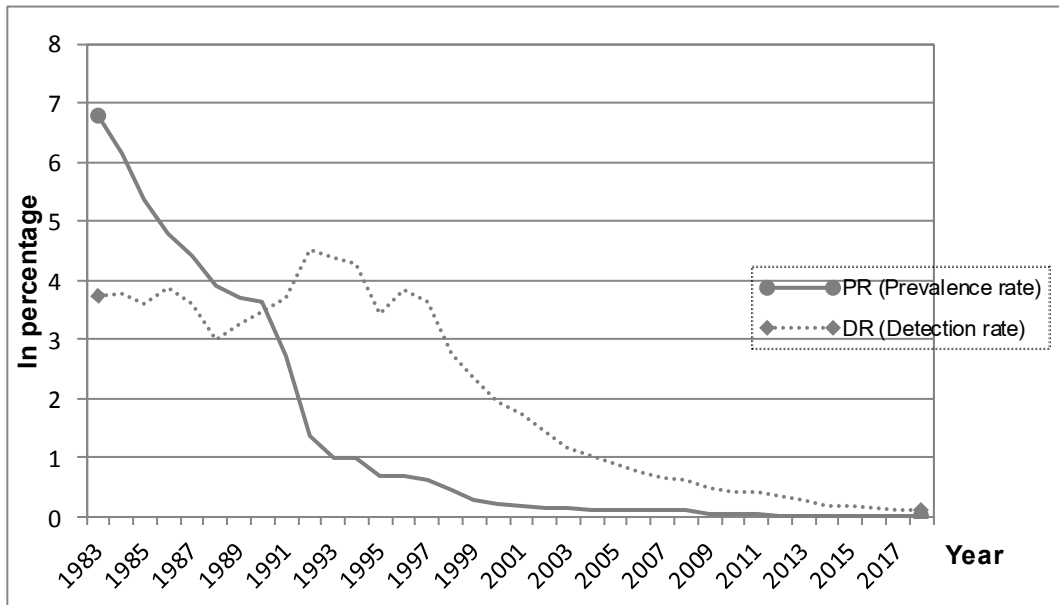
Figure1. Prevalence rate (PR) and detection rate (DR) of leprosy (1983-2018)

Analysis of data from 1983-2018 revealed that the prevalence rate has dropped significantly from 6.76 per 10,000 in 1983 to 0.01 per 10,000 in 2018. It is clear that over the past 35 years, leprosy prevalence rate has declined dramatically by around of 99%

Since the introduction of MDT, a remarkable improvement was also observed in the epidemiological situation. MDT had an enormous effect in reducing the disease burden. The prevalence rate continued to decline in all the provinces and at the end of the year 2018, the elimination target was also reached at the provincial level in the country.

3.2. Trend in case detection

As seen in table 1, new case detection in Vietnam from 1983 to 2012 fluctuated a lot. During the period 1983-1990, case detection remained relatively stable with only slight changes. However, during 1991-1997 the number of new case detected annually increased and this was mainly due to the acceleration of various activities for case detection that was carried out in the country. Many activities were implemented in certain areas especially to promote case-finding. A total of 32 special projects such as health education campaign, a special project for elimination of leprosy (SAPEL), leprosy elimination campaign (LEC), mini-LEC were implemented, covering more than 3 million inhabitants (Table 2). These projects led to an increase in new case detections and helped to clear up the remaining undetected (backlog) cases in endemic pockets which were mainly in the High Plateau areas and some places in the Southern Provinces.

This probably explained why the case detection peaked during the period of 1991-1997. However since then, in parallel with the decline in prevalence the annual new case detection also declined. With sustained case-finding efforts,

the number of new cases detected annually continues to decline and in 2018 it was reported to be 96 cases with a case detection rate of 0.10 per 100,000 population.
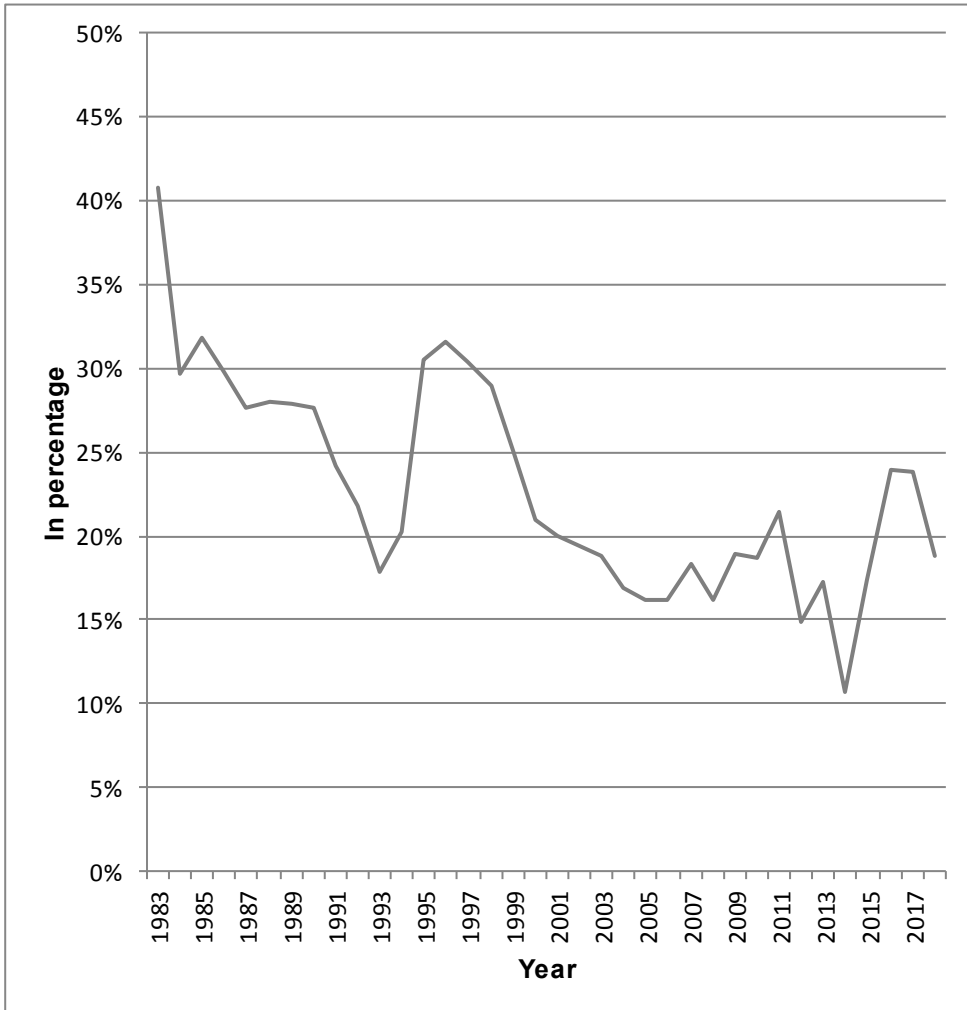
Table 3. Proportion of grade 2 disabilities among new cases, 1983-2018

Year	Grade 2 disabilities	
	Number	**Proportion(%)**
1983	825	40.82
1984	625	29.70
1985	655	31.77
1986	683	29.80
1987	605	27.70
1988	517	27.99
1989	577	27.83
1990	551	27.62
1991	606	24.20
1992	685	21.80
1993	569	17.86
1994	641	20.20
1995	789	30.50
1996	909	31.53
1997	854	30.40
1998	626	28.95
1999	450	25.07
2000	309	20.92
2001	267	19.99
2002	225	19.43
2003	179	18.86
2004	145	16.90
2005	121	16.22
2006	108	16.20
2007	101	18.30
2008	86	16.23
2009	78	18.89
2010	67	18.66

Year	Grade 2 disabilities	
	Number	**Proportion(%)**
2011	80	21.39
2012	44	14.86
2013	45	17.31
2014	20	10.7
2015	31	17.42
2016	33	23.91
2017	26	23.85
2018	18	18.75

3.3. Grade 2 disability among new cases

As shown in table 3 the proportion of grade 2 disabilities among new cases was highest in 1983 (40.82%). However, it declined in 1984 and reached a level of 17.86% in 1993. It then increased again reaching a level of 31.59% in 1996. This increase could be due to the intensive case-finding efforts that were carried out between 1991 and 1997. These case-finding efforts (table 2) have detected a large number of back-log cases most of whom were probably having a high proportion of disabilities as a result of delayed diagnosis. It could also be due to re-registration (recycling) of old patients as a new case especially those with disabilities. However, the grade 2 disabilities proportion among new cases started to decline from 1997 onwards and in 2018 it was 18.75%. The declining trend observed is a good indication but it needs to decline further. The delay in case detection as reflected by high grade 2 disabilities proportion among new cases could be due to high stigma in the community and low awareness about the disease in the general public.

Figure 2. Proportion of grade 2 disability among new cases

3.4. Female and children among new cases

Table 4 shows the proportion of female among new cases detected from 1983 to 2018. The proportion of female among new cases has increased to around 27-38% especially since 1995. Similar findings were also seen in some countries in the region such as Thailand (3,7,8).

As shown in table 4, the child proportion among new cases has always been below 10%. The child proportion has been fluctuating between 3.95% and 9.57% during the years 1983 to 1995. However, following the declining trend in the number of new cases detected annually, a similar decline was also observed in child proportion from 1995 to 2018. The proportion of children among new cases fell gradually from 9.57% in 1995 to 3.38% in 2012, a decrease by around 65%. More interesting, there was no child with leprosy was detected in the year 2018.
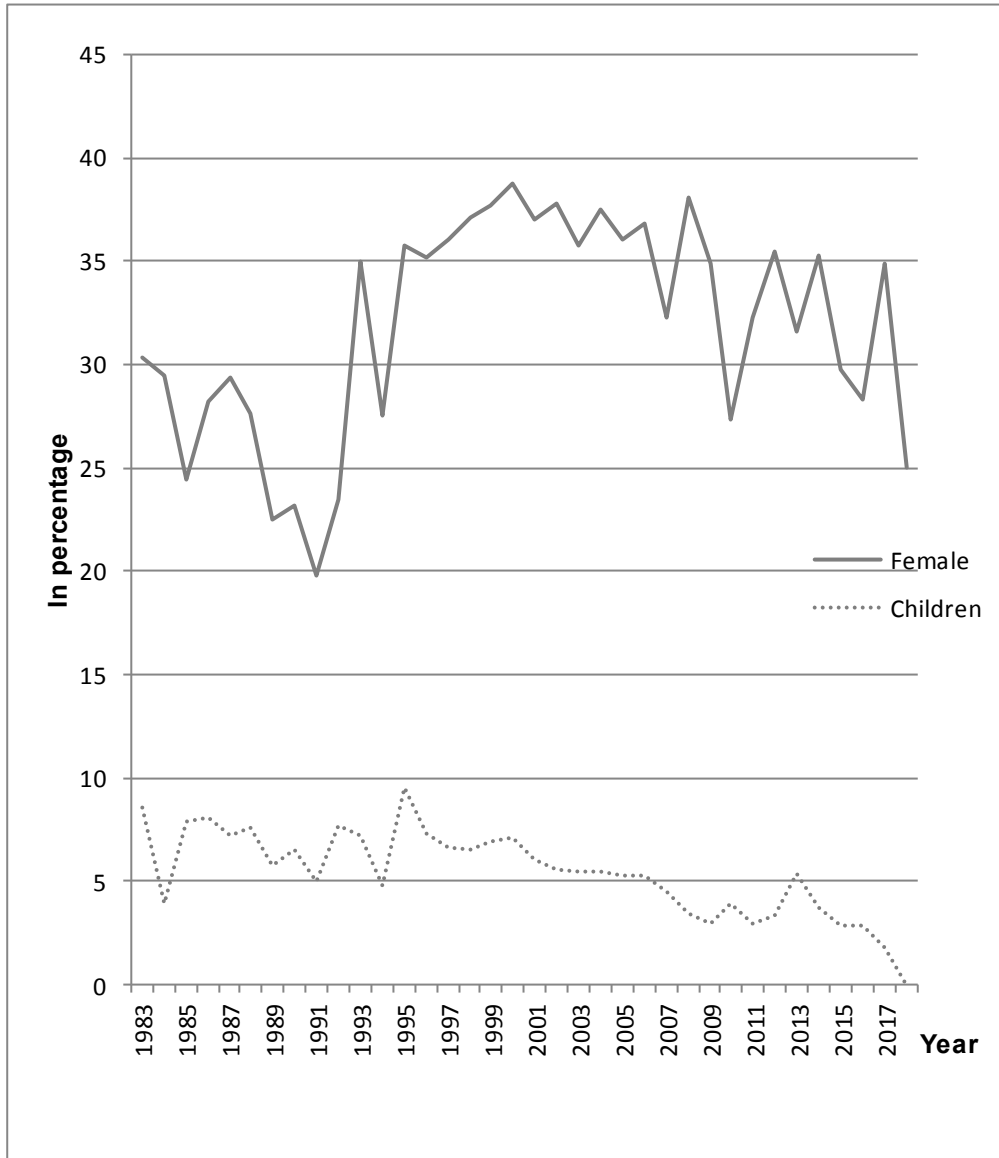
Figure 3. Proportion of female and children among new cases

Assuming that case-finding activities carried out especially among school children remain stable, the reduction in the proportion of children among new cases indicates that the transmission of the disease may be decreasing. However, as no serological tools are available at present to measure the transmission of the disease in the community this phenomenon can't be validated. Similar observations of a decrease in the case detection rate along with a decrease in the proportion of children among new cases have been seen in several other countries in South East Asia such as Myanmar, Bhutan, and Thailand (4,5,6,9).

Table 4. Propo female, children and MB patients amon newly detected cases, 1983-2018

Year	Female		Under 15 years old children		MB cases	
	Number	Proportion (%)	Number	Proportion (%)	Number	Proportion (%)
1983	612	30.28	169	8.59	811	40.10
1984	622	29.50	83	3.95	651	31.13
1985	504	24.40	141	7.84	804	39.10
1986	646	28.20	185	8.07	802	35.20
1987	642	29.40	157	7.21	1009	46.24
1988	509	27.60	141	7.63	738	39.60
1989	466	22.50	120	5.79	932	45.56
1990	463	23.20	130	6.52	798	39.40
1991	494	19.80	120	4.96	1075	43.40
1992	739	23.50	241	7.67	1413	45.50
1993	1114	35.00	231	7.25	1496	47.20
1994	872	27.50	151	4.76	2062	65.20
1995	926	35.70	222	9.57	1632	62.68
1996	1017	35.20	211	7.32	1807	63.70
1997	1011	36.00	159	6.66	1687	59.11
1998	803	37.10	162	6.49	1189	54.67
1999	676	37.70	124	6.91	1071	61.27
2000	571	38.70	105	7.11	905	62.00
2001	497	37.00	77	6.00	822	61.74
2002	437	37.74	65	5.61	715	62.17
2003	339	35.72	52	5.48	616	65.27
2004	322	37.53	47	5.48	570	66.59
2005	269	36.06	39	5.30	492	66.71
2006	245	36.79	35	5.26	443	66.80
2007	178	32.25	25	4.53	377	68.30
2008	202	38.11	18	3.40	378	71.32
2009	144	34.87	12	2.91	295	71.43
2010	98	27.30	14	3.90	259	72.14
2011	121	32.35	11	2.94	269	71.93
2012	105	35.47	10	3.38	191	64.53
2013	82	31.54	14	5.38	180	69.23
2014	66	35.29	7	3.74	153	81.82
2015	53	29.78	5	2.81	143	80.34
2016	39	28.26	4	2.90	115	83.33
2017	38	34.86	2	1.83	91	83.49
2018	24	25.00	0	0	89	92.71

3.5. Multibacillary (MB) among new cases

During the period 1983-1993, the proportion of MB patients among newly detected cases increased slowly from 40% to 47%. However, from 1998 onwards the increase was found to be more pronounced. In 2018 it was 92.71%. This increase in MB proportion could be due to changes in the criteria for classification and to some extent, it could also be due to changes in the clinical presentations. However, by looking at the available data one is unable to differentiate the operational and the epidemiological factors that are contributing to the increase in MB proportion among new cases.

4. CONCLUSION

It is clear that over the past 35 years, the profile of leprosy in Vietnam has changed significantly. With the introduction of MDT in 1983, the prevalence and case detection of leprosy has dramatically declined and majority of the patients are now able to lead normal lives in the community without being stigmatized and discriminated. MDT has made it possible to cure patients without any sequelae in majority of the patients. It has renewed the fight against leprosy in the country.

As a result of the remarkable reduction in the magnitude of the disease in the country leprosy is now becoming a rare disease in most parts of the country. In spite of the success in reducing the disease burden, it is crucial that the activities of the National Leprosy Control Programme (NLCP) are sustained and that the diagnosis and treatment services are made easily accessible to patients to ensure that the disease burden continues to decline further.

5. ACKNOWLEDGEMENT

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