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Case Study

Current Status of Kala-azar Elimination in Uttar Pradesh, India

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A B S T R A C T

The Government of India has targeted two vector borne diseases (VBDs) for elimination from the country namely Lymphatic Filariasis (LF) and Kala-azar. The disease Kala- azar (KA), Okay is to be eliminated by 2021 by bringing down the Kala-azar prevalence to <1 per 10000 population at sub district/ block level. The important interventions for Kala-azar elimination include Indoor residual spray (IRS) and active case searches (ACS) in the endemic districts. Out of 75 districts, 22 districts have reported kala-azar cases, of which six districts, Deoria, Kushinagar, Ballia, Varanasi, Sant Ravidas Nagar (Bhadohi) and Ghazipur, bordering or adjacent to Bihar have been considered endemic for kala-azar and the remaining 16 districts have reported sporadic occurrences of the disease either once or twice in different years. However, district Kanpur Nagar has not been mentioned in the reporting districts' list, as a Kala-azar case was reported from KGMU, Lucknow in May, 2017. The number of districts reporting Kala-azar cases never exceeded 07 in a year in the whole state except in the year 2021, when the number of reporting districts increased to 8. In UP, after 2018, none of the blocks in any of the KA endemic districts reported >1 Kala-azar case per 10000 population. Thus, the target of the prevalence of Kala-azar cases,<1 per 10000 population at the block level has been achieved by the state. Hence, the disease Kala-azar has been eliminated from the state and has sustained the achievement for a long duration till 2024. Necessary steps may be undertaken for its validation from a competent institution. Steps like (a) active case search drive for at least sweeping the whole population including the sporadic cases for non-endemic districts, (b) complete treatment of the KA cases (both VL & PKDL), (c) complete coverage of the population with IRS following the timeline and quality of IRS in accordance with NCVBDC (erstwhileNVBDCP) guidelines, and (d) synchronising KA intervention activities with neighboring states or countries subjecting their areas to KA elimination, may be addressed to maintain the sustainability of disease elimination status in Uttar Pradesh.

Keywords: Kala-azar Elimination, PKDL, Leishmania Donovani, Phlebotamus argentipes, Surveillance, Intervention Measures

Introduction

Uttar Pradesh is the largest state in India by population, with 247.27 million people (199.81 million as per the 2011 census). The state is comprised of 75 revenue districts and an area of 240928 sq.km, having a population density of 928 persons per sq.km. About two thirds of the population resides in rural areas and mainly depends on agricultural practices, as the Indo - Gangetic Plain is contributing a lot to the fertile agricultural region for the development of the state. In comparison to the earlier census and suitability of the environmental conditions, there has been an increase in population density to 928 persons per sq.km and literacy rate to 67.68% (male-77.28% &female – 57.18%) but the sex ratio has reflected a decline to 898 females/ 1000 males.

Concerned with the problem of Kala-azar in the country, the Kala-azar Control Programme is being implemented in the state under the umbrella coverage of the National Centre for Vector Borne Disease Control (NCVBDC) {erstwhile National Vector Borne Disease Control Programme (NVBDCP), Government of India (GOI)} with technical and financial support[1]. Prior to this, the disease kala-azar was looked at through general healthservices in the country. The programme brought a significant decline in Kala-azar morbidity but could not sustain the pace of decline for a longer period. The National Health Policy-2002 set the goal of Kala-azar elimination in India by the years 2010[2-5] in order to improve the health status of vulnerable groups and population at risk, living in Kala-azar endemic areas by the elimination of Kala-azar so that it no longer remains a public health problem. The target of elimination was revised to 2025[6] to bring down the annual incidence of Kala-azar to < 1 case per 10,000 population at the sub-district (block PHCs) level in Bangladesh and India and at the district level in Nepal.

Presently all programmatic activities are being implemented through NCVBDC (erstwhile NVBDCP) with the objectives of reducing Kala-azar in the vulnerable, poor and unreached populations in endemic areas; reducing case-fatality rates from Kala-azar to a negligible level;reducing cases of PKDL to interrupt transmission of Kala-azar; and preventing the emergence of Kala-azar and HIV/TB co-infections in endemic areas. The present paper deals with the efforts and progress of the state towards the elimination of the Kala-azar disease with sustainable target achieving impact long duration[7] and waiting for its validation.

Methodology

The national guidelines for Kala-azar elimination guided the planning and implementation of a multipronged approach. The surveillance was carried out by health workers/ASHAs twice in a year during the ACD fortnight drive. More than 1.60 Lacs of field Level Workers and community members were sensitised through 4583community sensitisation meetings conducted from 2019 to 2024 (upto Nov, 2024) in identifying KA cases and signs and symptoms. Moreover, 1878 community informers were sensitised in meetings conducted from 2019 to 2024 (upto Nov, 2024) in identifying KA cases based on signs and symptoms.

The surveillance activities were enhanced & intensified through ASHAs/volunteers during the Active Case Search Drive/ Dastak conducted twice in a year (April & October) and IRS operations (both rounds) during 2023 and 2024. The suspected cases of visceral leishmaniasis (VL) and post- kala-azar dermal leishmaniasis (PKDL) were confirmed by trained doctors at nearby treatment centres and were provided treatment at the earliest after confirmation. The data obtained in the districts was analysed and interpreted in the present article so as to reflect the progress achieved by the state towards the elimination of the disease.

Results and Discussion

From perusal of the state data, it was observed that the Kala-azar cases were reported so far from only 22 districts out of a total of 75 districts of the state (Table1 and Fig.1). Districts Deoria, Kushinagar, Ballia, Varanasi, Sant Ravidas Nagar Bhadohi and Ghazipur, bordering or adjacent to Bihar state (erstwhile north Bihar endemic for Kala-azar), have reflected regular reporting of Kala-azar cases and hence, these districts were considered endemic for Kala-azar disease. The remaining 16 districts have reported sporadic occurrences of the disease either once or twice in different years and are far away from the Bihar bordering districts. However, district Kanpur Nagar has not been mentioned in the reporting districts' list of the state, as this Kala-azar case was reported from King George Medical University (KGMU), Lucknow, in May, 2017.The person who succumbed later on was not brought to the notice of state health authorities by KGMU, Lucknow. The number of districts reporting Kala-azar cases never exceeded 07 in the whole state except in the year 2021, when the number of reporting districts increased to 8. As per the policy of the programme, 65 blocks belonging to 18 districts were monitored for surveillance activities in Fig 2 which were geared up and enhanced in these blocks from 2012 to 2024. During the enhanced survey drive, 34918 villages were surveyed during 2023 and 2024, in which out of 5718 suspected cases, 12 (0.21%) were confirmed Kala-azar (KA) and, out of 88 suspected cases, 20 (22.73%) were confirmed PKDL cases during 2023, whereas, out of 1780 suspected cases, 08 (0.45%) were confirmed Kala-azar (KA) cases and no suspected case could be confirmed as a PKDL case during 2024 (Table-2).

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Table 1.District wise Status of Kala-azar Cases in Uttar Pradesh from 1994 to 2024

S. No.	District/Year	1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004	
		C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**
1	Deoria	1	0	0	0	0	0	0	0	0	0	3	0	2	0	4	0	0	0	0	0	0	0
2	Kushinagar	0	0	0	0	0	0	0	0	61	7	55	5	40	0	21	3	30	1	19	0	1	0
3	Ballia	8	1	0	0	1	1	0	0	0	0	6	0	2	0	0	0	2	0	14	0	21	1
4	Mau	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Varanasi	45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
6	Ghazipur	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7	Jaunpur	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Bhadohi#	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Mirzapur	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Gorakhpur	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11	Ayodhya***	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Sultanpur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Gonda	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1
14	Bahraich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Rampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
16	Lucknow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Mahrajganj	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Kheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Azamgarh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Balrampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Bulandshahr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		59	1	15	0	1	1	1	1	61	7	64	5	47	0	25	3	32	1	34	1	36	2
No. of Districts reported KA case		7		2		1		1		1		3		5		2		2		3		3	

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S.No	District/Year	2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015	
		C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**
1	Deoria	0	0	3	0	2	0	3	0	1	0	1	0	1	0	2	0	2	0	11	0	5	0
2	Kushinagar	27	0	48	0	18	0	9	0	5	0	6	0	2	0	0	0	7	1	0	0	108	0
3	Ballia	20	1	16	0	15	0	16	0	6	1	3	0	2	1	0	0	0	0	0	0	15	0
4	Mau	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Varanasi	6	0	3	0	22	1	3	0	5	0	4	0	2	0	0	0	0	0	0	0	0	0
6	Ghazipur	0	0	0	0	9	0	0	0	0	0	0	0	3	0	3	0	2	0	0	0	2	0
7	Jaunpur	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Bhadohi#	0	0	7	0	0	0	7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9	Mirzapur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Gorakhpur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Ayodhya**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Sultanpur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13	Gonda	15	1	3	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Bahraich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Rampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Lucknow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Mahrajganj	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Kheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Azamgarh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	Balrampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Bulandshahr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		68	2	83	0	69	1	44	0	17	1	14	0	11	1	5	0	11	1	11	0	131	0
No. of Districts reported K A Case		4		7		6		7		4		4		6		2		3		1		5	

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S.No	District/Year	2016		2017		2018		2019		2020		2021		2022		2023		2024	
		C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**	C*	D**
1	Deoria	8	0	74	0	28	1	29	1	23	1	14	1	8	0	5	1	1	0
2	Kushinagar	79	0	89	0	46	0	30	5	16	0	15	0	7	1	7	0	8	0
3	Ballia	13	0	26	0	38	1	34	0	12	2	16	1	5	1	1	0	2	1
4	Mau	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Varanasi	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
6	Ghazipur	2	0	3	0	5	0	2	1	0	0	1	0	1	0	1	0	0	0
7	Jaunpur	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Bhadohi#	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9	Mirzapur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Gorakhpur	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11	Ayodhya**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Sultanpur	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Gonda	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
14	Bahraich	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15	Rampur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Lucknow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17	Mahrajganj	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0
18	Kheri	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
19	Azamgarh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
20	Balrampur	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
21	Bulandshahr	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Total		107	0	193	0	121	4	100	7	55	5	51	2	24	2	14	1	12	1
No. of Districts reported K A Case		7		5		7		7		6		8		7		4		4	

* = Cases
# = erstwhile part of district Varanasi
*** = erstwhile known as Faizabad

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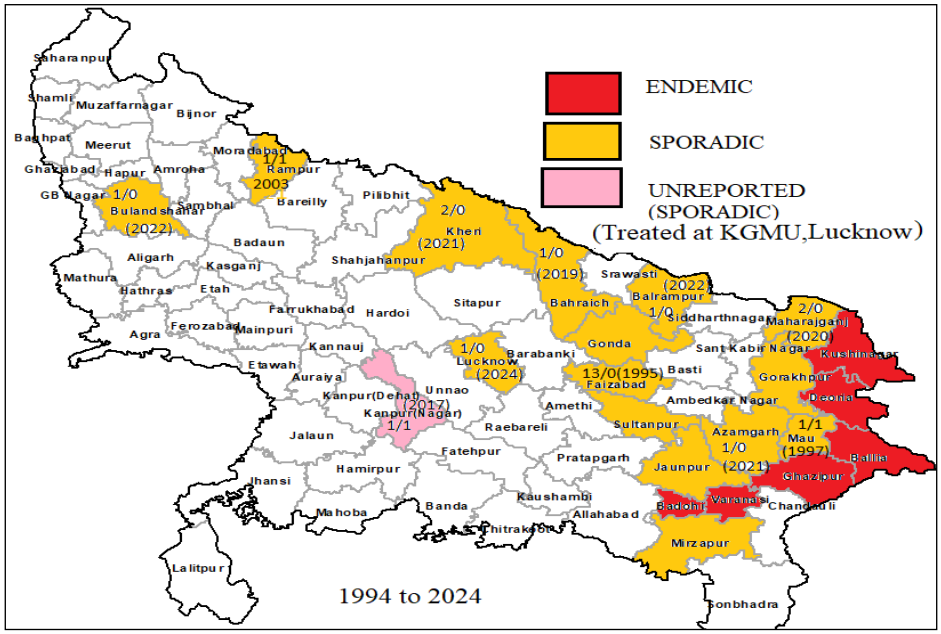

Figure 1.Kala-Azar Reporting Districts of UP

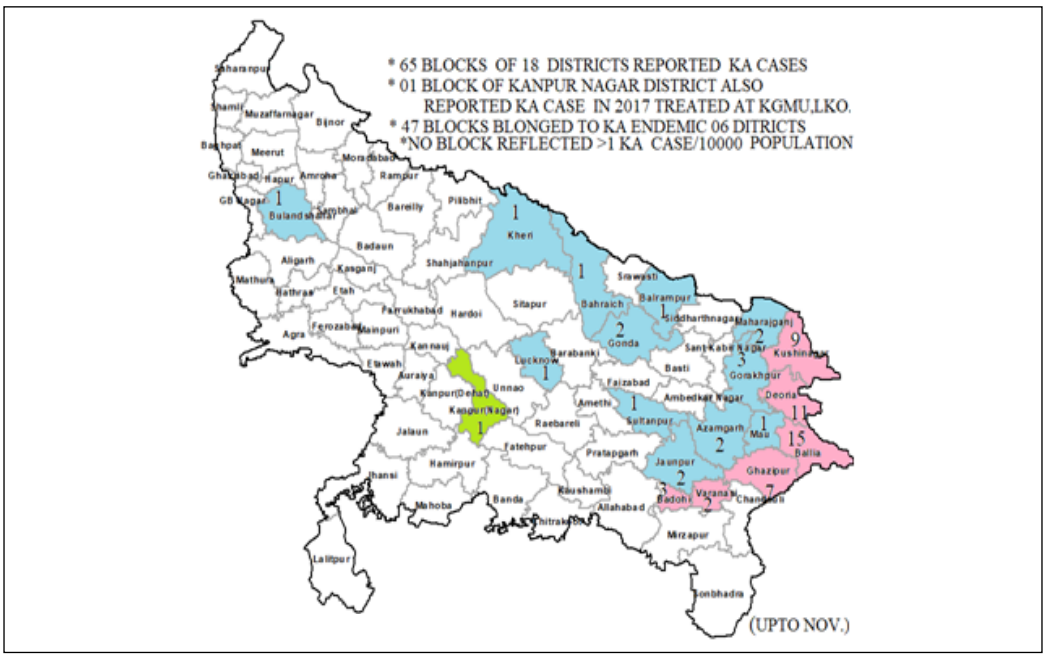

Figure 2.65 Blocks Reported Cases from 2012-2024

Table 2.Kala-azar cases detected in enhanced surveillance in UP

Method	2023		2024	
	Suspected Cases	Confirmed Cases	Suspected Cases	Confirmed Cases
House to House Survey				
No. of Villages Surveyed	34918		34918	
No. of KA Cases	2859	6	890	4
No. of PKDL Cases	44	10	0	0

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Dastak (Camp Based)				
No. of KA Cases	2735	3	835	2
No. of PKDL Cases	36	6	0	0
Regular/Planned Acd (Index Case Search)				
No. of KA Cases	101	3	50	2
No. of PKDL Cases	8	4	0	0
Acd During IRS				
No. of KA Cases	23	0	5	0
No. of PKDL Cases	0	0	0	0
Grand Total				
No. of KA Cases	5718	12	1780	8
No. of PKDL Cases	88	20	0	0

The enhanced surveillance resulted in a reduction in the average number of days from 6 days to 2 days in the identification of fever cases to Kala-azar cases by Rk 39 kits. (Fig.-3). The time duration could be reduced from 7days to 3 days from diagnosis to treatment (Fig.-4).The average number of days from the onset of fever in Kala-azar cases to treatment could be brought down from 52 days in 2018 to 31 days in 2024 (Fig.-5).Thus, the KA and PKDL cases were provided prescribed treatment at the earliest, which could completely cure the patients, resulting in only a few KA cases in 2024 and no PKDL case occurring.

At present, no block from 65 blocks of endemic and sporadic disease occurrence hasreported >1 KA case per 10000 population at the block level in a 6 years period after 2018. However, some increase in case fatality rate was experienced (Table-3).

Since the prevalence of Kala-azar cases <1 per 10000 population at the block level has been achieved by the state and no block of Kala-azar endemic districts has reported >1 Kala-azar case per 10000 population after 2018, it is imperative that the disease has been eliminated from the state and the states has sustained the achievement for a long duration of 6 years till 2024. Hence, necessary steps may be undertaken for its validation from a competent institution. Steps like (a) active case search drive for at least sweeping the whole population of the sporadic disease district with close vigil on its occurrence and spread, (b) complete treatment of the KA cases (both VL & PKDL), (c) complete coverage of the population with IRS following the time line and quality of IRS as per NCVBDC (NVBDCP) guidelines, and (d) synchronising intervention activities with neighboring states or countries subjecting their areas to KA elimination may be addressed to maintain the sustainability of disease elimination status in the state.

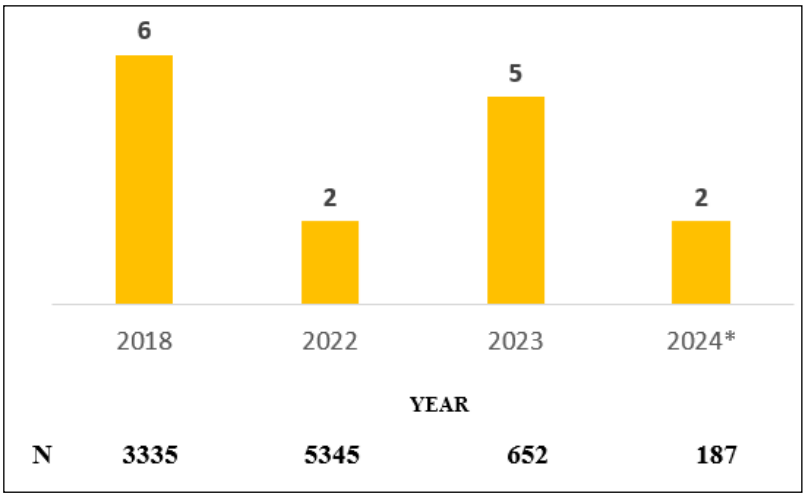

Figure 3.Reduction in average number of days from fever case identification by rK39 testing

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Figure 4.Reduction induration from diagnosis to treatment

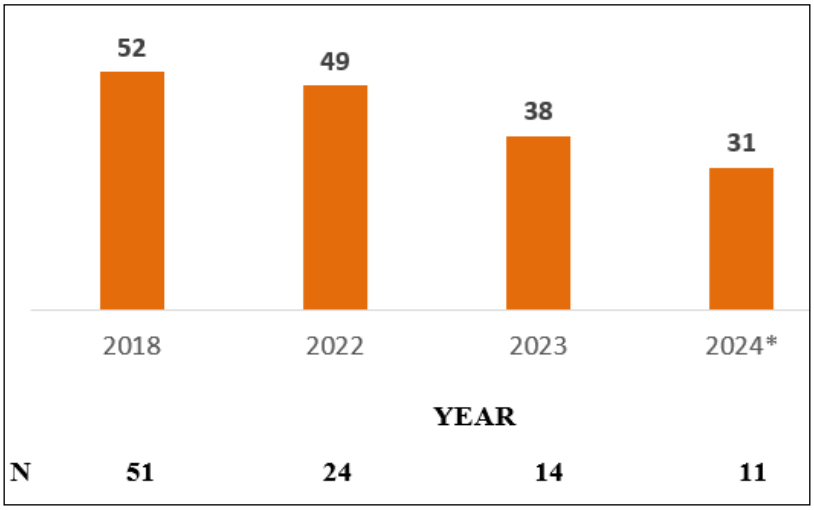

Figure 5.Reduction in average no. of days from onset of fever to treatment

Table 3.Kala-azar case fatality rate (CFR%) from 2012-2024

Year	No. of KA Cases	No. of Deaths	Case Fatality Rate (%)
2012	5	0	0.00
2013	11	1	9.09
2014	11	0	0.00
2015	131	0	0.00
2016	107	0	0.00
2017	193	0	0.00
2018	121	4	3.31
2019	100	7	7.00
2020	55	5	9.09
2021	51	2	3.92
2022	24	2	8.33
2023	14	1	7.14
2024	12	1	8.33

Conclusion

On the basis of the foregoing findings and discussion,it can be inferred that the prevalence of Kala-azar cases has come down to <1 per 10000 population at the block level, and thus the state has achieved the KA elimination target, as no block of Kala-azar endemic or sporadic districts has reported >1 Kala-azar case per 10000 population after 2018. And the state has sustained the achievement of KA elimination for a long duration of 6 years till 2024. Thus, the disease, has been eliminated from the state. Hence, necessary steps may be undertaken for its validation from a competent institution. Steps like (a) active case search drive for at least sweeping the whole population of the endemic and sporadic disease district with close vigil on its occurrence and spread, (b) complete treatment of the KA cases (both VL & PKDL), (c) complete coverage of the population with IRS following the time line and quality of IRS as per NVBDCP guidelines, and (d) synchronising intervention activities with neighbouring states or countries subjecting their areas to KA elimination may be addressed to maintain the sustainability of disease elimination status in the state.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process: None

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