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# Regional Strategic Framework for Elimination of Kala-azar from the South-East Asia Region (2005-2015)



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# CONTENTS

	<i>Page</i>
1. INTRODUCTION .....	1
1.1 Current Burden of Visceral Leishmaniasis (Kala-azar) in the Region.....	1
1.2 Factors Favourable for Elimination of Kala-azar .....	1
1.3 Constraints in Elimination .....	2
1.4 Relevance of Kala-azar Elimination to Millennium Development Goals .....	3
2. GOAL AND TARGET .....	3
2.1 Goal .....	3
2.2 Target.....	3
3. OBJECTIVES .....	3
3.1 Impact Objective.....	3
3.2 Process Objectives.....	3
4. STRATEGIES .....	4
4.1 Early Diagnosis and Complete Case Management .....	4
4.2 Integrated Vector Management (IVM) with the Focus on Indoor Residual spraying (IRS).....	5
4.3 Effective Disease Surveillance through Passive and Active Case Detection and Vector Surveillance .....	6
4.4 Social Mobilization and Building Partnerships .....	7
4.5 Operational Research .....	7
5. PHASED IMPLEMENTATION OF THE PLAN FOR ELIMINATION OF KALA AZAR .....	8
5.1 Preparatory Phase (Duration: one year).....	8
5.2 Attack Phase (Duration: five years).....	10
5.3 Consolidation Phase (2011-2013) .....	11
5.4. Maintenance Phase (Duration to be decided) .....	11
6. REGIONAL UPDATE ON KALA-AZAR ELIMINATION .....	12

6.1	Intercountry Consultative Meeting in Varanasi, India in November 2003 .....	12
6.2	Memorandum of Understanding for Intercountry Cooperation.....	12
6.3	Regional Technical Advisory Group (RTAG) .....	12
7.	FUTURE PLANS.....	12
7.1	Development of Country Strategic Plan.....	12
7.2	Development of Technical Guidelines .....	13
7.3	Drug Quality, Drug Supply and Logistics .....	13
7.4	Geographic Mapping for IRS .....	13
7.5	Technical support at Local Levels.....	13
7.6	Research Protocols and Capacity Development in Operational Research .....	13
7.7	Coordination with Partners .....	14
8.	MONITORING AND EVALUATION.....	14
	Annex – Monitoring and evaluation framework .....	15

# 1. INTRODUCTION

## 1.1 Current Burden of Visceral Leishmaniasis (Kala-azar) in the Region

Leishmaniasis occurs in two forms (a) cutaneous and (b) visceral. Visceral Leishmaniasis (kala azar) is often fatal if untreated. It is transmitted by the bite of the infected female phlebotomine sandfly. Leishmaniasis are endemic in 88 countries with an estimated yearly incidence of 1–1.5 million cases of cutaneous leishmaniasis (CL) and 500 000 cases of visceral leishmaniasis (VL) or kala-azar. In WHO's South-East Asia Region about 147 million people in three countries (Bangladesh, India and Nepal) in the Region are at risk of kala-azar. The border districts in Bhutan are also at risk due to movement of people from neighbouring countries. During 2000-2002, the reported cases were only 24 287, 18 472 and 22 030 respectively. Estimates indicate about 100 000 cases per year in the Region. The disease occurs predominantly in the poor and marginalized communities. Nearly 2.4 million disability-adjusted life years (DALYs) are lost each year due to kala-azar globally. The SEA Region accounts for the loss of about 400 000 DALYs. The economic burden of the disease in the affected areas in the Region is large even though precise estimates are not available.

## 1.2 Factors Favourable for Elimination of Kala-azar

- Biological factor
  - In the SEA Region, man is known to be the only reservoir host for kala-azar and *P.argentipes* is the only known vector. These unique features in the Region favour elimination of the disease.
- Technical factors
  - Availability of a new, safe and effective oral drug (miltefosine). Alternative effective medicines are available to provide back-up in referral hospitals;

- Availability of reliable and easy-to-use rapid 'rk 39' diagnostic dipstick test kits;
- Positive experiences in the past in controlling the disease using indoor residual spraying (IRS) as a collateral benefit of malaria control;
- *Strong political commitment* in the three countries through inter-country collaboration favours feasibility of elimination of the disease, and
- The disease is limited to 96 districts in the three endemic countries, so the elimination efforts can be focused.

### 1.3 Constraints in Elimination

- Lack of knowledge of the incidence of the disease constrains the planning of elimination.
- Patients of kala-azar seek treatment from private doctors/quacks who provide incomplete or inappropriate treatment which is expensive. The treatment is often delayed. The delay in treatment favours continued transmission of the disease. The drugs that are currently used show variable efficacy and are toxic. In India, resistance is reported in more than 50% cases treated with SAG.
- There is persistence of the reservoir in the form of cases of PKDL. The cases of PKDL have been increasing steadily since the 1970s. These cases often remain undetected and untreated.
- The vectors are in abundance in peri-domestic areas. The outdoor sleeping habits of people during the summer months favours the transmission of the disease.
- The vector thrives in cracks and crevices of mud-plastered houses, heaps of cow dung, in rat burrows, and in bushes and vegetations around houses where spraying may not be done.
- The disease is increasingly affecting the poorest in the community. They cannot afford the expensive treatment.

## 1.4 Relevance of Kala-azar Elimination to Millennium Development Goals

The first goal of MDG is to eradicate extreme poverty and hunger. Elimination of kala-azar will help in the mitigation of poverty in the affected areas.

## 2. GOAL AND TARGET

### 2.1 Goal

To contribute to improving the health status of vulnerable groups and at-risk population living in kala-azar endemic areas of Bangladesh, India and Nepal by the elimination of kala-azar so that it is no longer a public health problem.

### 2.2 Target

To reduce the annual incidence of kala-azar to less than one per 10,000 population at the district or sub-district level (*upazila* in Bangladesh, sub-district in India and district in Nepal) by 2015.

## 3. OBJECTIVES

### 3.1 Impact Objective

To reduce the annual incidence of kala-azar and PKDL to less than one per 10 000 population at the district (or sub-district) level by the end of 2012 by:

- Reducing kala-azar, including in the vulnerable, poor and unreachd populations in endemic areas;
- Reducing case fatality rates from kala azar;
- Reducing the cases of PKDL to interrupt transmission of kala-azar, and
- Preventing the emergence of kala-azar/HIV/TB coinfections in endemic areas.

### 3.2 Process Objectives

- To improve the effectiveness of programme management with a focus on policy, planning and regulation;

- To enhance capacity-building at all levels in kala-azar endemic districts;
- To establish effective disease and vector surveillance system for planning and response supported by reliable laboratory diagnosis;
- To ensure early diagnosis and complete case management of kala-azar;
- To undertake disease prevention and control by integrated vector management through selective stratified IRS, ITN and environmental management with community participation and intersectoral collaboration, and
- To conduct operational research on important elements of elimination activities.

## **4. STRATEGIES**

### **4.1 Early Diagnosis and Complete Case Management**

Effective case management of kala-azar requires improved home care management (improved health care practices and increased health care-seeking from trained health care personnel (including doctors and nurses), reliable laboratory facilities and adequate supply of medicines. Early diagnosis and complete treatment strategy would help reduce case fatality rates and increase the credibility of the health system, in order to increase the utilization of health services by people suspected to be suffering from the disease. It is proposed to use an agreed case definition of the disease as a starting point. The case definition for suspecting kala-azar agreed in the informal country consultation (2003) and endorsed by RTAG (2004) is the history of fever of more than two weeks in a patient with no response to antibiotics and antimalarials. This case definition is likely to be sensitive but not specific. Additional signs that are useful include weight loss, and enlarged liver and spleen. However, these are not likely to be recognized by health workers and health volunteers. Patients with the above-mentioned symptoms should be screened by 'rk 39' or DAT and if positive, treated with an effective drug. Confirmation of kala-azar can be done by examination of bone marrow aspiration but this is difficult and invasive. Therefore it can be done only in some hospitals (district hospitals in Bangladesh and India and zonal hospitals in Nepal). The effective and safe oral drug recommended is miltefosine. This drug has been registered in India. It cannot be used in early pregnancy and in women of reproductive age who are not using contraceptives regularly. If

possible, miltefosine should be administered as directly-observed treatment in order to retain its efficacy and delay the appearance of drug resistance. Use of treatment cards is likely to contribute to better compliance. Paromomycin, an injectable drug, is promising and is undergoing phase III trials. Amphotericin B and liposomes are rescue drugs in the treatment of kala-azar.

## **4.2 Integrated Vector Management (IVM) with the Focus on Indoor Residual spraying (IRS)**

The mainstay of vector control is IRS. While DDT can be used for the control of kala-azar in India, suitable alternatives have to be selected in Bangladesh and Nepal since DDT is not available or is not recommended by the national policy in these countries. Pyrethroids can be considered though these are very expensive and rapid development of resistance is a constraint. Adoption of a uniform insecticide strategy is advisable through intercountry cooperation. Through geographical mapping and RS, the water bodies should be identified in the district selected and spray operations carried out within a radius of one kilometer of these water bodies. The mapping of the district for water bodies would be useful in limiting the spray operations to those areas where maximum impact is likely to occur. This will help economise on insecticide consumption and help control environmental degradation. Selective IRS would be advisable only when the surveillance is geared up and geographic mapping with validation is available; until then, IRS based on incidence reporting may be possible. Spray operations should be undertaken at the time of the year, which is most appropriate. The IRS should achieve maximum coverage and be done thoroughly in order to have a lasting impact. Community mobilization is required to get maximum cooperation from households so that the IRS helps in eliminating the vector effectively. The IRS should be followed by entomological work to provide evidence on the efficacy of IRS. This strategy would help contain the costs also ensure good quality of IRS operation in order to produce the desired impact. Another strategy that will complement IRS is to reduce the human vector contact through the insecticide-treated bednets (ITNs). The strategies for ITNs/LLINs should be developed and the distribution monitored for impact. Sanitation in the household and peridomestic environment plays an important role in eliminating vector breeding and reducing longevity with consequent reduced risk of transmission. The success of ITNs and environmental sanitation would depend on effective behaviour change communication. Therefore behaviour change communication strategy that includes ITNs and environmental management is to be considered as a part of IVM. This should be sustainable.

### 4.3 Effective Disease Surveillance through Passive and Active Case Detection and Vector Surveillance

The cases of kala-azar for surveillance should be classified into (a) suspect; (b) clinical and (c) confirmed cases. The adoption of this approach will help in the use of uniform criteria. Surveillance includes the reporting of cases of PKDL since these are responsible for continued transmission of the disease.

Surveillance through passive case detection is currently done in government institutions. This does not give a true picture since (a) majority of cases of kala-azar go to private doctors including quacks and there is no reporting from these providers; (b) treatment is often started without a definitive diagnosis of kala-azar, and (c) many cases do not seek health care at all because of poverty and socio-cultural constraints. Despite the above constraints, passive case detection and reporting is used to monitor the trends of the disease. The strategy will be to strengthen the reporting through improved diagnosis and treatment and to establish partnership with private health care providers including private doctors and to ensure that community is empowered with knowledge of risks of seeking services of quacks for diagnosis and treatment, as an effort to make appropriate treatment available to the community through qualified professionals. For improved surveillance, kala-azar should be made a notifiable disease in affected areas. Disease surveillance for kala-azar should comprise monthly reporting and feedback at the district level, and evolving a system of regular reporting mechanism with the state and the national authorities. Reporting to WHO should be done on an annual basis and endemic countries should send reports on an agreed reporting format.

As the programme improves and the capacity is increased, passive case detection will be supplemented with active case detection that is supported by laboratory diagnosis of kala-azar. While active case detection is recommended at least once in a year in the beginning, active case detection will become more important as the number of cases reported by passive case detection decline. Active case detection should be supplemented by laboratory confirmation of cases suspected.

Surveillance of *P. argentipes* vector is important to determine the distribution, population density, major habitats, and spatial and temporal risk factors related to kala-azar transmission. It would be important to monitor the levels of insecticide resistance. The information on vector surveillance would

be crucial for planning and programming integrated vector management (IVM) strategy. Integrated disease (including PKDL) and vector surveillance is recommended in the programme for kala-azar elimination.

#### **4.4 Social Mobilization and Building Partnerships**

Behaviour change interventions are important in the elimination of kala-azar and for the success of early diagnosis and treatment adherence. Effective behaviour change communication can also help in promoting early care seeking. The participation of community and families in indoor residual spray and in reducing human vector contact is necessary. Social mobilization should be an integral part of the elimination programme right from its inception. National programmes should plan adequate resources for effective behaviour change communication.

Partnerships will be necessary at all levels i.e. at the district and state level, at the national level and with international stakeholders. Some of the elimination and eradication programmes (polio, leprosy, lymphatic filariasis) owe their success to multi-partner leadership.

Partnerships networking and collaboration will be required with other programmes like vector-borne disease programmes (malaria, dengue filaria) and others e.g. HIV/AIDS, TB, and leprosy. Anaemia control, improvement in nutritional status and poverty alleviation programmes should be made partners of kala-azar elimination programme.

#### **4.5 Operational Research**

Diagnostic and therapeutic tools are available for elimination of kala-azar. More research is required to enable the addition of new drugs and diagnostics. The available diagnostic tests should be validated under field conditions. Additional research is needed to identify and evaluate techniques for rapid assessment and mapping of the disease, to develop mechanism for monitoring the effectiveness of intervention strategies. Operational research is recommended to establish monitoring of drug resistance, drug efficacy and quality of drugs used in the programme. Research is also needed to optimize the effectiveness of drugs including the use of combination drugs in the treatment of kala-azar. Research is also needed in searching for cases of PKDL and for satisfactory treatment of cases of PKDL. This is at present, a serious

constraint in the elimination of kala-azar. Implementation research is required in pilot districts where the programme should be monitored closely to identify the constraints and the lessons learnt. Research on increasing the access of interventions to the poorest people and for operationalizing IVM is recommended. An important operational research issue is to evaluate the public-private mix. Networking is an important strategy to optimize operational research and link it with the programme implementation.

## **5. PHASED IMPLEMENTATION OF THE PLAN FOR ELIMINATION OF KALA AZAR**

The kala-azar elimination programme will consist of four consecutive phases.

### **5.1 Preparatory Phase (Duration: one year)**

The preparatory phase begins after the plan has been prepared and approved by the three countries and will include preparations for operations (including a pilot total coverage spraying operation and establishment of diagnosis and treatment facilities) in selected districts in endemic countries and monitoring (including passive and active case detection and vector monitoring). This will be useful to identify the constraints and operational difficulties. The lessons learned during this phase can be useful in the attack phase of elimination.

The main activities proposed include the following:

- Development/review of national policy, and strategic plans. National plans should include regulation, standards and norms (Member States). The policy should cover issues relating to intercountry cooperation. The regulations should cover uniform standards relating to diagnosis and treatment, insecticides to be used in IRS, tax exemptions, and making the disease notifiable in endemic areas (Member States).
- Development of advocacy plans that include advocacy kits, donor profiles, and highlight the close nexus of kala-azar with HIV/AIDS, TB and Leprosy. Advocacy plans should showcase the importance of elimination of kala-azar as a strategy for poverty reduction and to enhance the socio economic development of affected areas (Member States).
- Preparation of national plans that include budget and resource gaps (Member States).

- Consolidation of national plans into project document for mobilizing resources (WHO/SEARO).
- Constitution of national coordination committee and task force/working group (Member States).
- Signing of memorandum of understanding for intercountry cooperation and cross border collaboration (WHO, Member States).
- Formation of regional alliance/partners, forum for resource mobilization, advocacy and to assist in periodic review for elimination of kala-azar (Member States, WHO and other partners).
- Mobilization of additional resources (Member States and WHO) .
- Geographical mapping and RS for integrated vector management (Support to Member States from WHO).
- Validation of disease burden/cases of kala-azar (WHO support to Member States)
- Development and adaptation of technical guidelines and reporting formats (WHO)
  - Technical guidelines (diagnosis and treatment of kala-azar and PKDL,IRS and ITNs);
  - Training package (doctors, nurses, health workers and spray teams, supervisors);
  - Surveillance guidelines (disease surveillance, vector surveillance);
  - Reporting system, reporting formats;
  - Supervisory system, quarterly monitoring and check-lists;
  - Country programme and review guidelines.
- Development of materials for behaviour change communication including guidelines for home care (Member States).
- Training of personnel (doctors, health workers, staff for IRS, survey team, laboratory staff, data management staff, supervisors) with assistance from WHO.
- Identification of research priorities and initiation of research on estimation, geographical mapping and RS for IRS, development of new products (research on diagnostics and drugs) with assistance from WHO.

- Establishing system of procurement, logistics and supplies (drugs and equipment) with support from WHO.
- Intensive implementation in selected districts (Member States).
- Development of partnerships in the health sector (HIV/AIDS, TB, leprosy, malaria and other vector-borne diseases, nutrition, anaemia etc.) and outside the health sector (environment, poverty reduction)

## **5.2 Attack Phase (Duration: five years)**

The attack phase will begin in 2007 when the preparatory phase has ended, provided that all the tasks of the preparatory phase have been completed. This phase will include implementation and monitoring.

The main activities proposed during this phase include the following:

- Indoor residual spray in all the affected areas for five consecutive years in collaboration with vector-borne disease control programme (Member States). This should be according to the agreement reached among the three endemic countries.
- Integrated vector management including ITNs and environmental management. Monitor the expansion and coverage of ITNs (Member States).
- Access to early diagnosis and complete treatment (Member States).
- Passive case detection, active case detection and vector surveillance, case-based diagnosis and monthly feed-back (Member States).
- Community mobilization for vector control and for seeking early treatment (Member States).
- Monitoring of treatment completion and analysis of treatment failure (Member States).
- Cross border meetings to review progress and exchange information (Member States and WHO).
- Quarterly monitoring, annual review (input, process, output and outcome indicators) to be carried out by Member States. Annual reporting to WHO on an agreed reporting format.
- Household and health facility survey once every 2-3 years followed by external country evaluation (Member States with support from WHO).

- Increasing the research capacity and networking among research institutions through a research coordination mechanism (WHO and partners with Member States).
- Active case-search at least once in an year in rural and urban areas (Member States).

### **5.3 Consolidation Phase (2011-2013)**

The consolidation phase will begin when the total coverage by spraying is no longer carried out i.e. at the end of the attack phase. This phase will end after the period of three years of active surveillance has shown no increase in the incidence rate at district and subdistrict levels in endemic countries.

The main activities to be carried out during this phase include the following:

- Limited indoor residual spraying based on the geographical location of cases, and in areas with high vector density (Member States).
- Intensified active case detection (Member States).
- Early diagnosis and complete treatment to be sustained with focus on coinfections (Member States).
- Treatment adherence (Member States).
- Continued activities of the attack phase like monitoring, research, review meetings and periodic evaluation (Member States).

### **5.4. Maintenance Phase (Duration to be decided)**

During this phase, the surveillance against reintroduction of kala-azar will be the responsibility of the disease control programme in the country until kala-azar is no longer a public health problem in these countries. During this phase, the case incidence at district/sub-district level should be less than 1 per 10 000 population. An international review commission should verify the achievements of the kala-azar elimination programme. Countries or the affected districts in the countries where elimination targets have not been reached would require corrective measures. The maintenance phase will be followed by certification of the elimination status. The duration of this phase will be decided by the partners.

## **6. REGIONAL UPDATE ON KALA-AZAR ELIMINATION**

### **6.1 Intercountry Consultative Meeting in Varanasi, India in November 2003**

The draft Regional Strategic Plan was discussed. The consultation endorsed the regional strategic plan in principle and recommended that the Member States should pursue the goal of elimination of kala-azar and develop national action plans with targets at different levels of programme implementation. Member states should define specific timelines to measure progress towards the elimination of kala-azar. It was also recommended that national policies and strategies are to be prepared for advocacy, consensus, resource mobilization and sustained political commitment.

### **6.2 Memorandum of Understanding for Intercountry Cooperation**

During the informal meeting among the ministers of health from Bangladesh, India and Nepal, held in Maldives on 5 September 2004, all three countries confirmed their strong political commitment for sustainable elimination programme through intercountry collaboration and agreed on a common framework for intervention and monitoring in the three endemic countries. The memorandum of understanding between the three countries will be signed to affirm this commitment in May 2005 in the presence of donors and partners.

### **6.3 Regional Technical Advisory Group (RTAG)**

WHO/SEARO has established a Regional Technical Advisory Group to advise WHO on key issues such as policy, strategy, activities that are crucial for accelerating the elimination of kala-azar and operational research. The first meeting of RTAG was held in Manesar, Gurgaon, India in December 2004. It endorsed the Regional Strategic Plan and Regional Guidelines for preparing the national plans in principle. Meetings of RTAG will be held at least once a year.

## **7. FUTURE PLANS**

### **7.1 Development of Country Strategic Plan**

The countries have agreed on preparing country-specific plan for elimination by the end of March 2005. WHO support will be provided on request from

Member States. The country plans will be consolidated into a project document that will identify the resource gaps. This will be used for advocacy.

## **7.2 Development of Technical Guidelines**

WHO will develop and distribute necessary guidelines and tools to programme managers. They will include: comprehensive guidelines on elimination of kala-azar; guidelines on preparation, implementation and monitoring of the programme; guidelines for preparing country strategic plan for elimination of kala-azar; training guidelines on diagnosis and case management guidelines for home care and environmental management with the focus on improving the home and peridomestic environment; indoor residual spraying for health staff and volunteers to be involved in elimination of kala-azar, and surveillance guidelines on disease occurrence and vector.

## **7.3 Drug Quality, Drug Supply and Logistics**

WHO will develop standards of quality for drugs and laboratory supplies, guidelines on monitoring the quality of drugs, efficacy of drugs and drug resistance and diagnostic kits. These will be made available to national authorities.

## **7.4 Geographic Mapping for IRS**

WHO will provide assistance to the Member States through training of staff to do geographical mapping in affected districts. Health mapper is proposed to be used.

## **7.5 Technical support at Local Levels**

WHO will provide technical support for programme management and implementation at local levels (district and sub-district) by NPO/State Coordinator/District Coordinator (Consultants) etc. depending on the individual country's needs and the resources that are available.

## **7.6 Research Protocols and Capacity Development in Operational Research**

SEARO will work with TDR and WHO CCs and research institutions to decide research priorities, and support the development of research protocols. It will

assist the development of research capacity in countries. Networking of research through multicentric research and research coordination mechanism would be facilitated.

### **7.7 Coordination with Partners**

WHO will assist in cross-border meetings and in coordination with partners (partners, forum/regional alliance) to mobilize additional resources needed to support the elimination of kala-azar. WHO will also facilitate periodic country reviews/evaluation of regional programme for kala-azar elimination.

## **8. MONITORING AND EVALUATION**

A framework for monitoring and evaluation of kala-azar has been prepared. It is attached as an annexure.

## Annex

### Monitoring and evaluation framework

Level	Area	Key questions	Indicator suggested	Frequency of measurement	Responsible agency	
Input	Policy, strategy and guidelines	Are the national policy, strategy and guidelines in place?	National policy and strategy documents.	Before starting, and after 3-5 years	National Programme Manager	
	Advocacy plans	Have the advocacy plans been prepared?	Written advocacy plans.	Once.	National Programme Manager	
	National plans for kala-azar elimination	Have the national plans for kala-azar elimination been prepared?	National plans for elimination of kala-azar prepared consistent with Regional strategic plans	Once every two years	National Programme Manager	
	Funds		Have the additional funds needed been mobilized? Have the gaps in funding being identified?	Project document that identifies funding gaps. Funds mobilized during the year.	Once an year	National Programme Manager and donors
			What efforts were made to mobilize the additional funds?	Advocacy meetings or negotiations held with partners to mobilize additional funds.	Quarterly	National Programme Manager, WHO
	Coordination mechanism for kala-azar elimination .	Has a national coordination committee/ task force or a working group been formed for elimination of kala-azar constituted? Does the committee meet regularly?	Functional Coordination committee/Task force/Working Group for elimination of kala azar. Number of times the coordination committee has met during the last one year.	Once in 4 years. To be reconstituted after that. Quarterly	Health Secretary/DG as the chairperson National Programme Manager	
Process	Standard guidelines for training of	Have the standard guidelines for training of doctors and health	Standard guidelines for prevention, diagnosis and	Once with periodic updating.	Programme Manager/ Institutions of expertise	

Level	Area	Key questions	Indicator suggested	Frequency of measurement	Responsible agency
	doctors and health workers.	workers been developed?	treatment of kala azar available	Quarterly update.	National trainers, State focal points and district trainer.
	Training of doctors, health workers and other service providers in treatment and prevention of kala-azar.	How many doctors, health workers volunteers and other service providers been trained in the prevention, diagnosis and treatment of kala - azar?	Proportion of doctors trained. Proportion of health workers & other service providers trained in treatment.	Once a year.	Entomology group.
	Supervision of service providers (health workers).	How many supervisory visits were made?	Number of spray teams trained . Number of supervisors trained .	Quarterly review.	District and state focal points.
		Were supervisory check-lists used?	Number of districts where supervision was done once in the last three months.	Quarterly review.	District focal point.
	Supply of diagnostics and medicines.	Have the procurement mechanisms for supplies prepared?	Proportion of supervisors who use the checklists.	Once.	National Programme Manager.
		Is there a system worked out to ensure regular supply of diagnostics and drugs?	Written statement of system of procurement .	Once a year review.	District/state focal point.
		What is being done to ensure quality of drugs and diagnostics?	System of supplies/ Training on supply chain management.	Quarterly review.	National focal point in consultation with WHO.
	Active case search	Is active case search a part of national elimination programme?	Proportion of health facilities where quality check done.	Once a year review.	Programme Manager
	Supply of insecticides.	Are there recommendations about the use of insecticides for spray?	Proportion of cases detected through active case search.	Once at the beginning and then updated after 3/4 years.	Vector control group at district and state levels.
		Were supplies of insecticides and equipment to targeted districts made in time?	National guidelines on IRS for kala azar elimination.	Once per year.	District focal point.
			Number of targeted districts that have		

Level	Area	Key questions	Indicator suggested	Frequency of measurement	Responsible agency
	Procurement and distribution of ITNs.	Is there a strategy for procurement and distribution of ITNs? Are the ITNs distributed to the poorest among the poor population?	adequate supplies of insecticides and equipment . No. of ITNs distributed.	Quarterly	District focal point District focal point
	Stock outs of medicines, diagnostics and insecticides?	Are there any stock outs of medicines, diagnostics and insecticides?	Proportion of poor households given ITNs. Proportion of facilities with stock-out of medicines. Proportion of facilities with stock-out of diagnostics.	Quarterly Quarterly	District focal point District focal point
	Service delivery.	What is the access of facilities for treatment of kala- azar? Is there supervision of health facilities?	Proportion of facilities with stock outs of insecticides prior to spraying. Population with access to kala-azar treatment Number of supervisory visits to the health facilities.	Once a year. Once a year review. Quarterly review.	National focal point and working group. District focal point.
Outcome	Knowledge and practices relating to prevention and treatment.	What is the knowledge of the target population about the health facilities that provide diagnosis and treatment of kala-azar?	Knowledge of the population about facilities that provide diagnosis and treatment of kala-azar.	Periodic: once in 3-4 years at different locations.	National programme manager in collaboration with district health authorities.
	Active Case Detection	Whether active case search organized?	Number of kala-azar & PKDL cases detected through active case search.	Once a year review	Programme manager
Outcome	Treatment coverage	Is there an increase in the number of cases treated?	Number of cases of kala-azar treated.	Regular and ongoing. Review quarterly	National Programme Manager. Programme Manager
	Treatment adherence	Are the people completing treatment according to advice?	Number of patients with kala-azar who complete treatment according to advice	Household survey Sample	Programme Manager

Level	Area	Key questions	Indicator suggested	Frequency of measurement	Responsible agency
	Treatment outcome	Do people respond to the treatment?	Proportion of patients cured	Household survey; once in 2-4 years.	Programme Manager
	Participation in prevention	Do people cooperate in IRS.	Proportion of households where there was full cooperation with residual spray.	Household survey; once in 2/ 3-4 years.	Programme Manager
		Do people practices sanitation/self protection	Proportion of people aware of role of sanitation/with well ventilated dry shelters and clean peridomestic surroundings	Household survey; once in 2/3-4 years.	Programme Manager.
			Proportion of people using ITNs etc.	Household survey once in 2, 3-4 years	
Impact	New cases of kala-azar	Is there a decline in the reported cases?	Number of cases who are diagnosed as kala-azar.	Record review: ongoing.	Programme Manager.
	Deaths due to kala-azar	Is there a decline in kala-azar specific deaths?	Number of deaths due to kala-azar.	Record review: ongoing.	District focal point.
	PKDL	Is there decline in PKDL prevalence?	Number of PKDL detected & treated.	Record review ongoing.	District focal point.
			Proportion of cases of PKDL diagnosed and treated.	Household survey.	Programme Manager