Process of validation of elimination of kala-azar as a public health problem in South-East Asia

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1. Introduction

Worldwide, an estimated 200 000–400 000 new cases of kala-azar (KA) or visceral leishmaniasis (VL) occur annually [1] of which Bangladeh, India, and Nepal, and harbour an estimated 67%. In the South-East Asia Region, kala-azar is predominantly endemic in Bangladesh, India and Nepal. There are also sporadic cases in Bhutan and Thailand. In Thailand, the epidemiology of KA still needs to be clarified. In this Region, the causal parasite species is *Leishmania donovani*, the vector, *Phlebotomus argentipes*, and the transmission cycle is anthroponotic. In 2005, the Governments of Bangladesh, India and Nepal, supported by WHO, launched a regional kala-azar elimination initiative to reduce cases to a level where it is not a public health problem any longer [2]. The target is to maintain the annual incidence rate below 1 KA case per 10 000 population at upazila (Bangladesh), subdistrict/block (India) and district level (Bhutan and Nepal).

The expected impact of this elimination initiative includes (i) reducing KA in the vulnerable, poor and unreached populations in endemic areas; (ii) reducing case-fatality rates from KA to a negligible level; (iii) reducing cases of post-kala-azar dermal leishmaniasis (PKDL) by interrupting transmission of KA; and (iv) preventing the emergence of KA/HIV/TB coinfections in endemic areas [3].

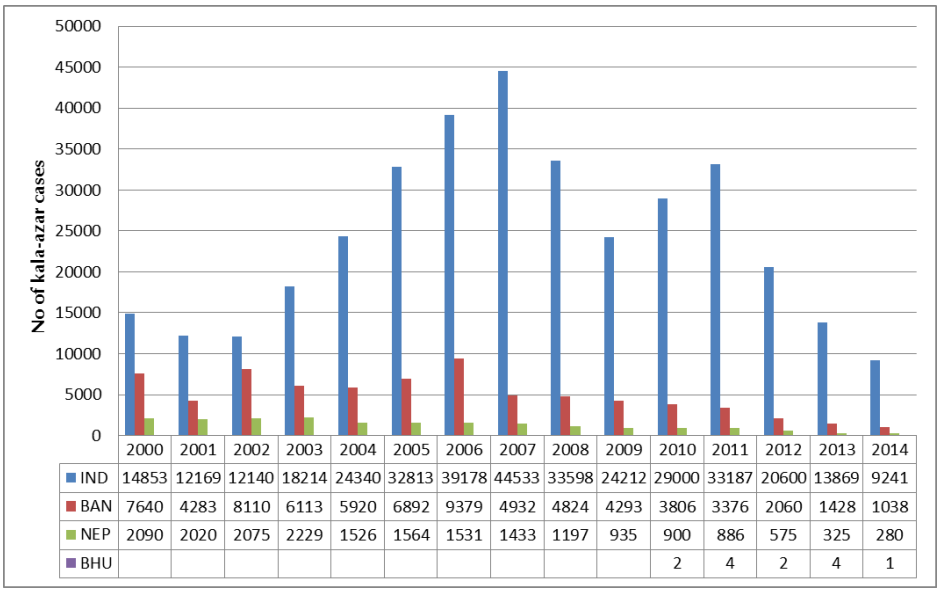
The main strategies in this campaign are (i) early diagnosis and complete treatment; (ii) integrated vector management; (iii) effective disease and vector surveillance; (iv) social mobilization and partnerships; and (v) clinical and operational research [3].

The kala-azar elimination programme consists of four consecutive phases: (i) the **preparatory phase:** This phase begins after the plan has been prepared and approved by individual countries. It includes development/review of national policy, strategic and advocacy plans, operational plans to implement the national plan for elimination, development and adoption of technical guidelines and reporting formats, etc.; (ii) the **attack phase:** This phase begins when the preparatory phase

has been completed and includes implementation and monitoring of the strategies. The main activities include integrated vector management (IVM) with indoor residual spraying (IRS) in all the affected areas for five consecutive years, early diagnosis and complete treatment and active surveillance of cases; (iii) the **consolidation phase:** This phase begins when total coverage by IRS has concluded, i.e., at the end of the attack phase. This phase will end after three years of active surveillance has shown no increase in the incidence rate at district/subdistrict/upazila levels in the endemic countries. The main activities to be carried out during this phase include limited IRS, intensified active case detection (ACD) along with early diagnosis, and complete treatment; (iv) the **maintenance phase:** During this phase, the case incidence at the district/subdistrict or upazila level should be less than 1 per 10 000 population and surveillance against re-emergence of kala-azar will be continued.

Since the launch of the campaign, there has been an augmentation and intensification of the activities in all three countries. This has been reflected in a decrease in case numbers (Fig. 1) and incidence rates. In India, the number of cases decreased from 44 533 cases recorded in 2007 to 9241 in 2014. Similarly, in Bangladesh, in 2006, cases were reduced from 9370 to 1038 in 2014 and in Nepal from 1564 in 2005 to 280 in 2014. This has also been reflected in the proportion of blocks reaching the elimination target of < 1 in 10 000 population (Fig. 2). By 2014, the elimination target was reached in all the endemic districts in Nepal, in 96% of the endemic upazilas in Bangladesh, and 74% of the endemic blocks in India.

Figure1: *Reported kala-azar cases, 2000 to 2014 in Bangladesh, Bhutan, India and Nepal*



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
IND	14853	12169	12140	18214	24340	32813	39178	44533	33598	24212	29000	33187	20600	13869	9241
BAN	7640	4283	8110	6113	5920	6892	9379	4932	4824	4293	3806	3376	2060	1428	1038
NEP	2090	2020	2075	2229	1526	1564	1531	1433	1197	935	900	886	575	325	280
BHU											2	4	2	4	1

Source: WHO-SEARO reported number of cases

However, the actual number of VL cases is considered to be much higher than what the official records show, as a significant proportion of cases may not be recorded in the surveillance system of the government programme. Variable ratios of underreporting have been described in the Region (Singh 2006) and the true burden of the disease is not exactly known. Moreover, cases of post-kala-azar dermal leishmaniasis (PKDL) are considered to be a potential reservoir particularly during the inter-epidemic periods. There has been an increase in cases of PKDL reported in