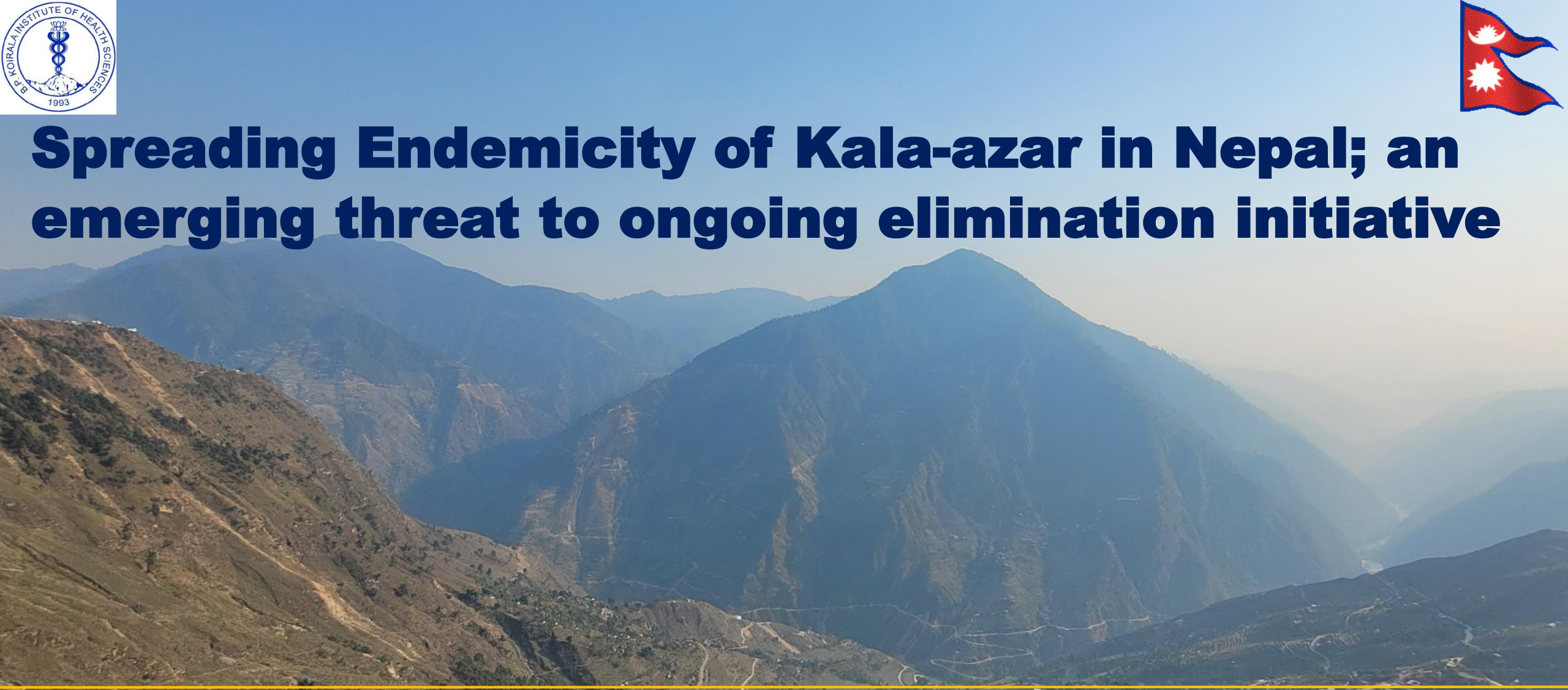
Spreading Endemicity of Kala-azar in Nepal; an emerging threat to ongoing elimination initiative



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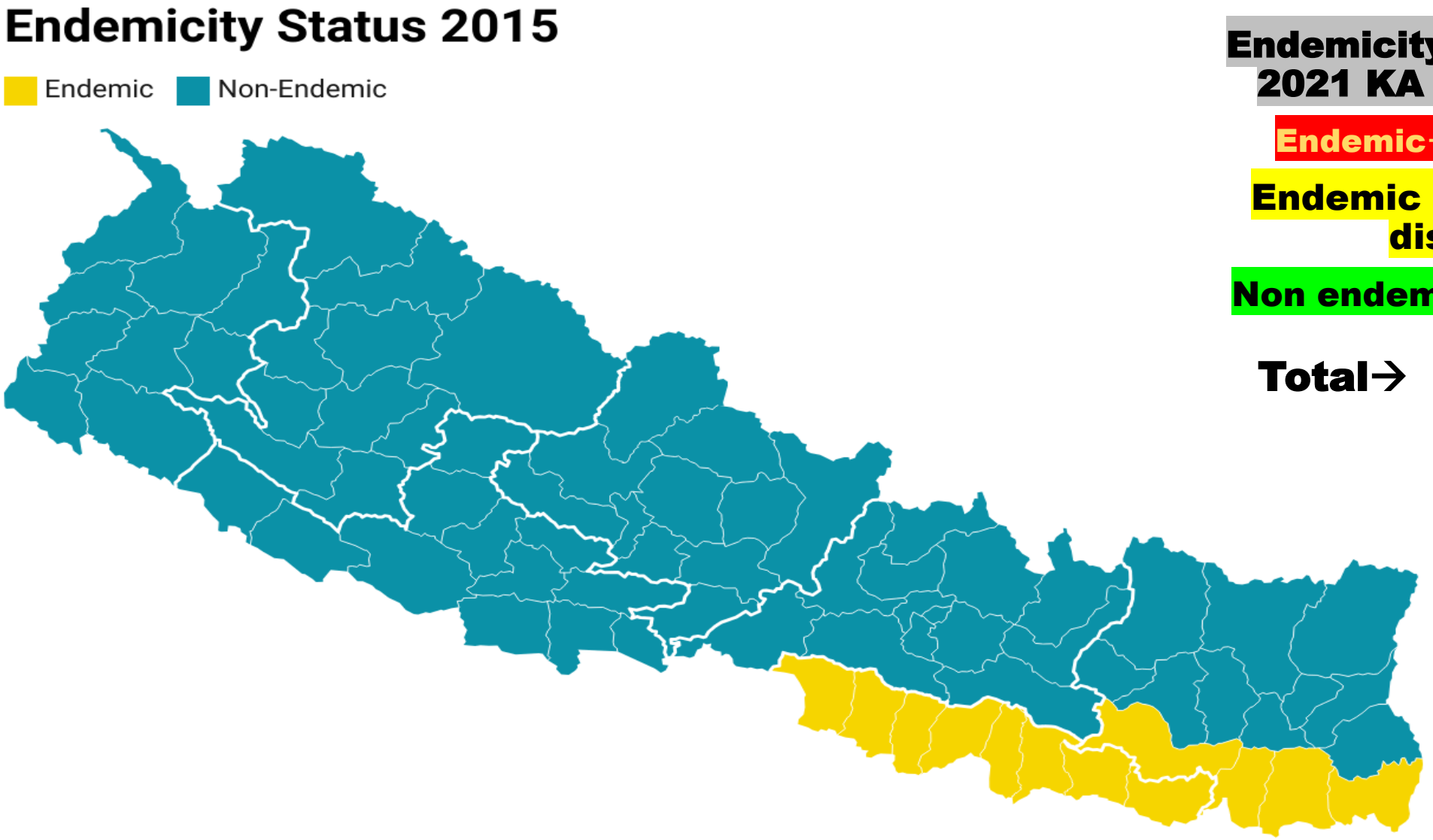
Background (1/2): 12 KA endemic districts (1980 -2016)

- Kala-azar (KA) is a vector-borne neglected tropical disease
  - Caused by *Leishmania donovani*
  - Transmitted by female sandfly (*Ph.argentipes*)
- Initially, 12 districts were endemic for KA
- Major public health problem, targeted for elimination as public health problem by 2030.

Background (2/2): Geographical Shift of KA Endemicity



Endemicity status as per 2021 KA data (EDCD)

Endemic→ 23 districts

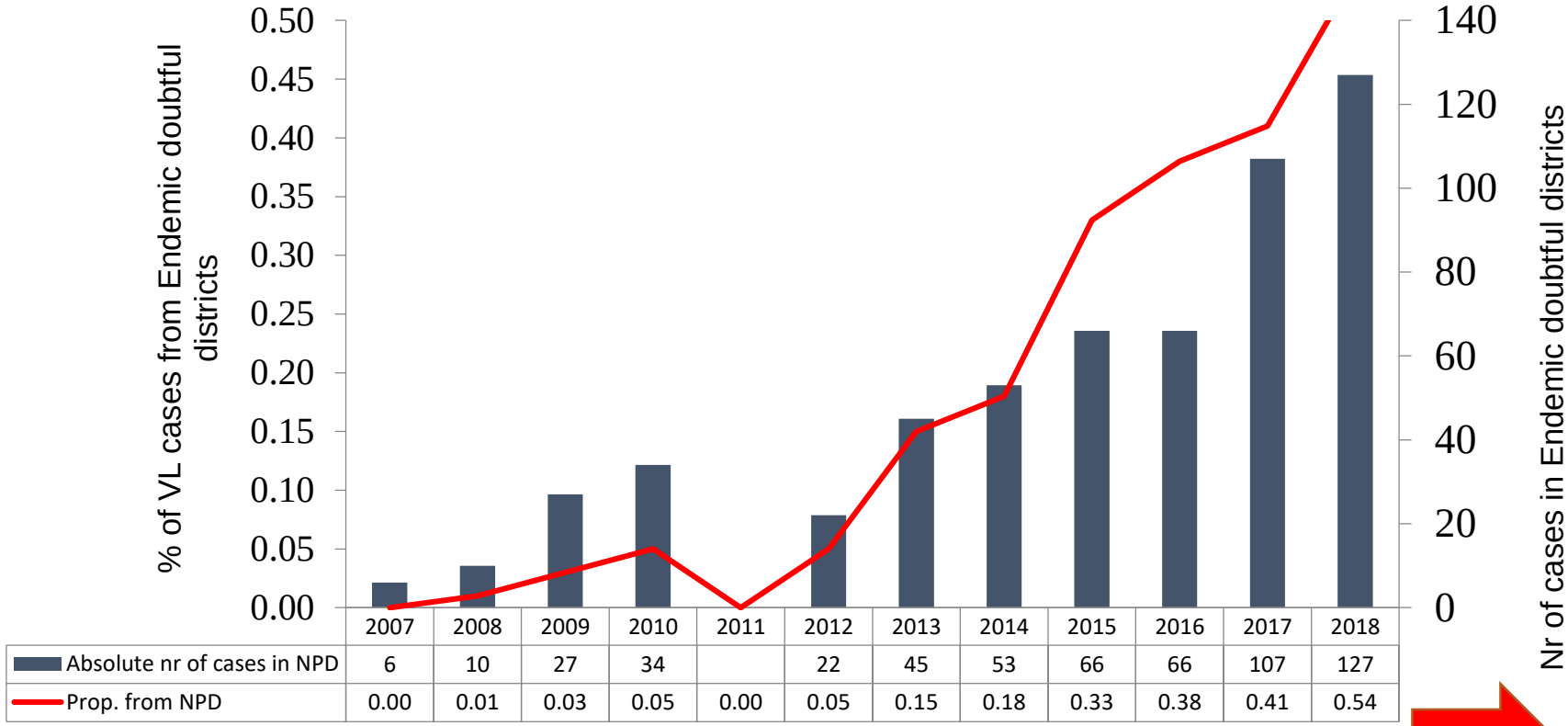
Endemic doubtful→ 49 districts

Non endemic→ 5 districts

Total→ 77 districts

Rationale : Increasing reported of KA cases from Endemic doubtful districts *(EDCD: 2014 – 2018)*

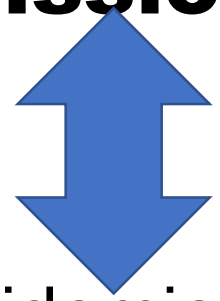
- Geographical expansion including high altitude districts
- New foci in hilly & mountaneous districts (Kalikot & Dolpa districts..)
- Increasing number of cases from endemic doubtful districts



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Absolute nr of cases in NPD	6	10	27	34		22	45	53	66	66	107	127
Prop. from NPD	0.00	0.01	0.03	0.05	0.00	0.05	0.15	0.18	0.33	0.38	0.41	0.54

Objective of the survey

Local transmission of *L. donovani* ?



- ❖ Epidemiological link?
- ❖ More (asymptomatically) infected individuals?
- ❖ Vector present?

- Need to be explored: **import cases (economic migration)** *or* **local transmission?**
  - Impact: Revision of policy/risk map
  - Strengthen the surveillance and control activities

Methods : three pillars on investigation

Epidemiological evidence for local transmission

(case validation, clustering of cases, risk factors)

Serological evidence for local transmission

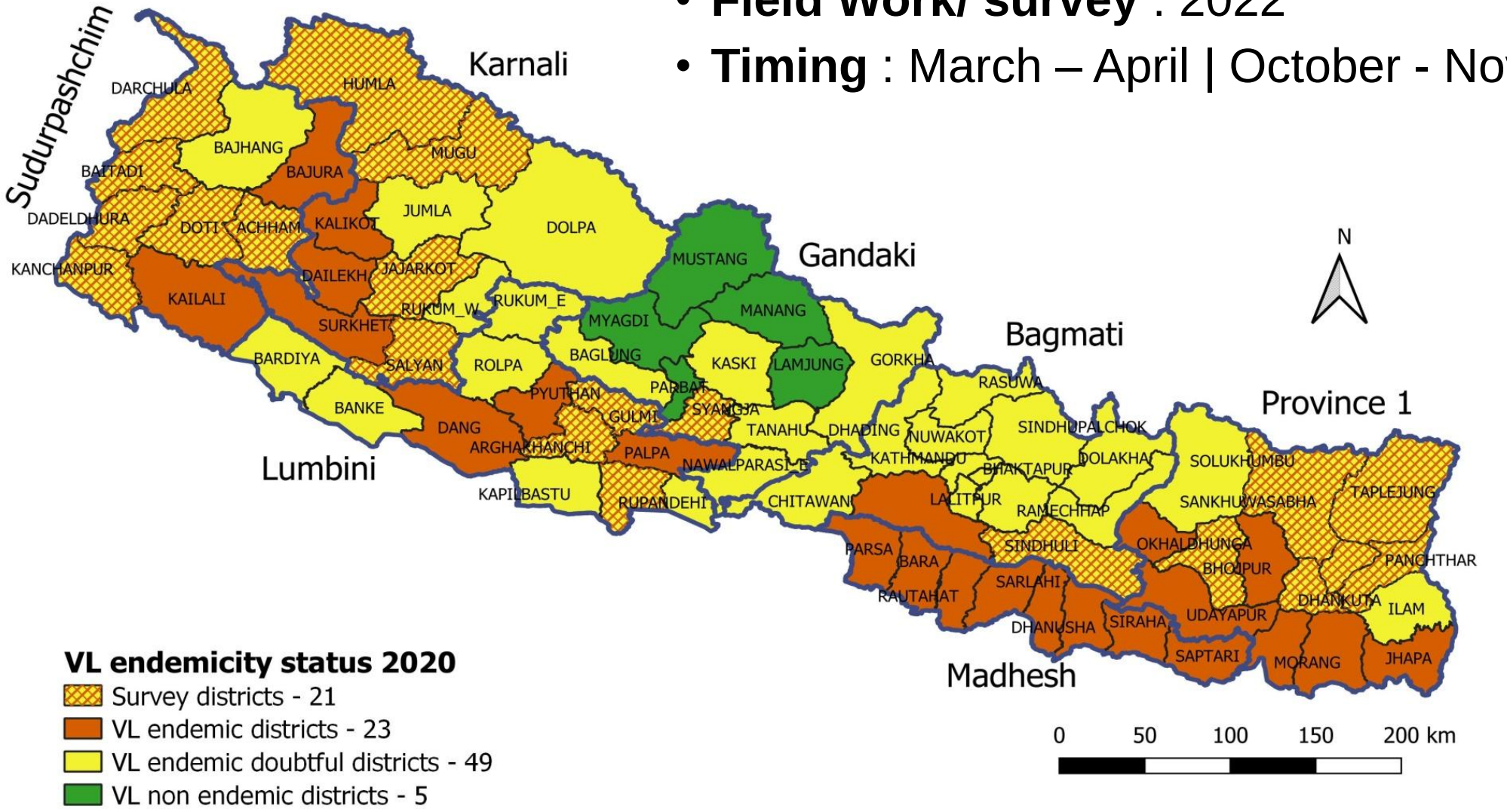
(Presence of antibodies against Leishmania in the permanent habitants)

Entomological evidence for local transmission

(Presence of the vectors)

Study sites: 21 endemic doubtful districts (62 clusters)

- **Field Work/ survey** : 2022
- **Timing** : March – April | October - November



Field activities

1. Community meeting

2. Household survey

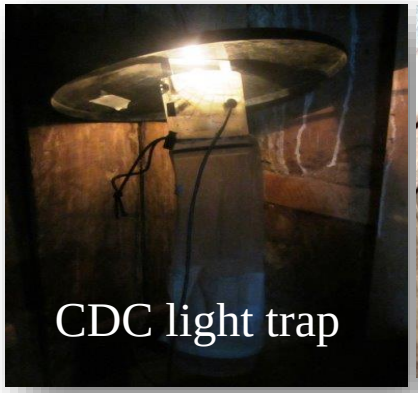
- HHs Survey: travel history of past KA & exposure to other (pre
- Active case finding arround index case
- Suspecious symptom (fever ≥ 2 weeks) rK39 RDT was perfor
- In case RDT positive, referred to nearest KA treatment centre

3. Blood sample collection (sero-prevalence)

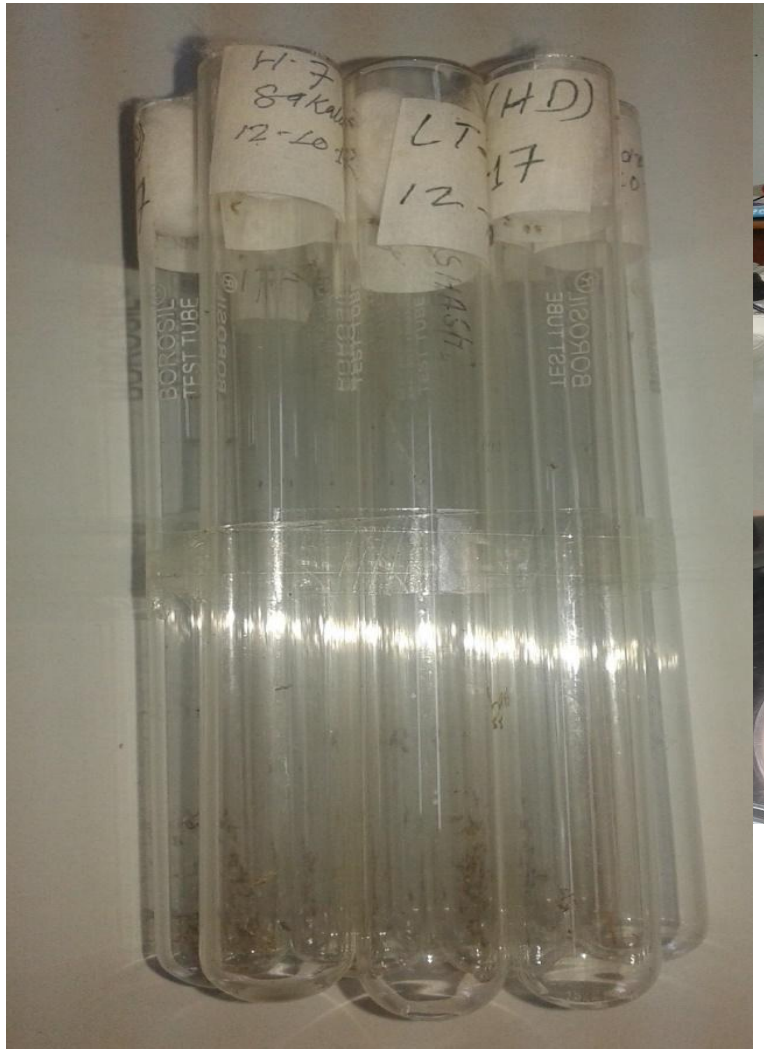
- DAT test; titre of ≥ 1:1600 as marker of infection

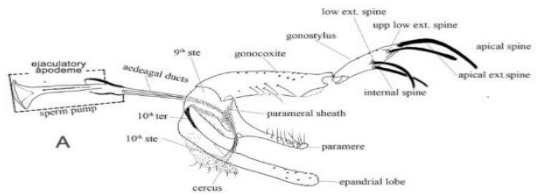
4. Entomology survey

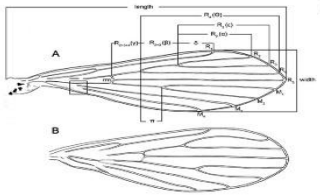
- CDC light traps collection in minimum of 6 hhs/clusters
- Two consecutive nights
- Households and/or cattle sheds or mixed dwellings
- Supported by mouth aspiration

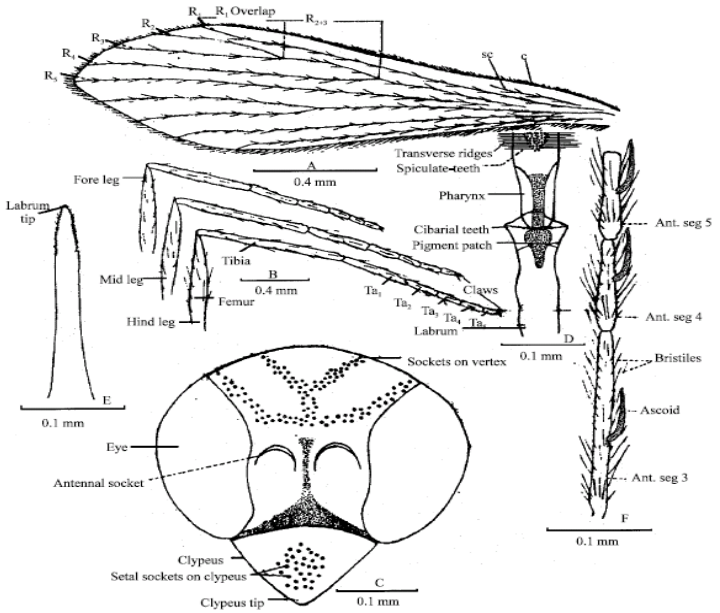


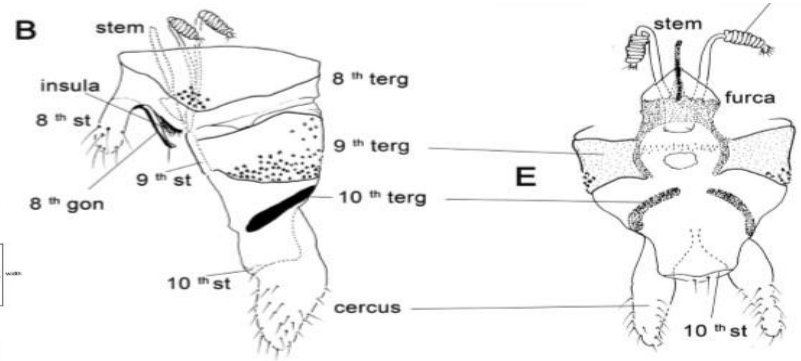
Morphological identification of captured sandflies





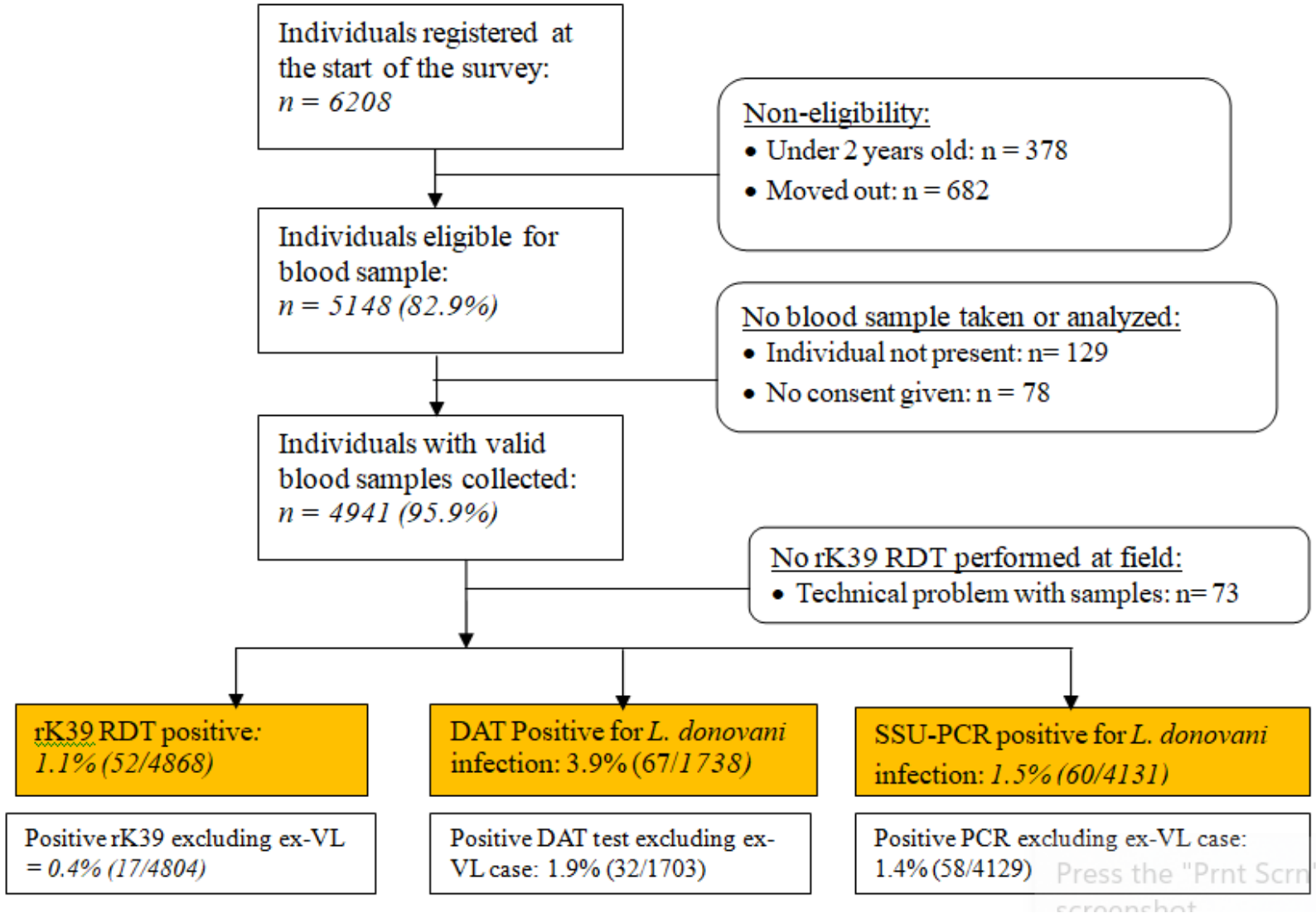






Morphological Identification:- *Regional Key (Kalra and Bang, 1988; Lewis DJ, 1978)*

Results : Epidemiological evidence- *Leishmania donovani* infection (Pillar I & II)



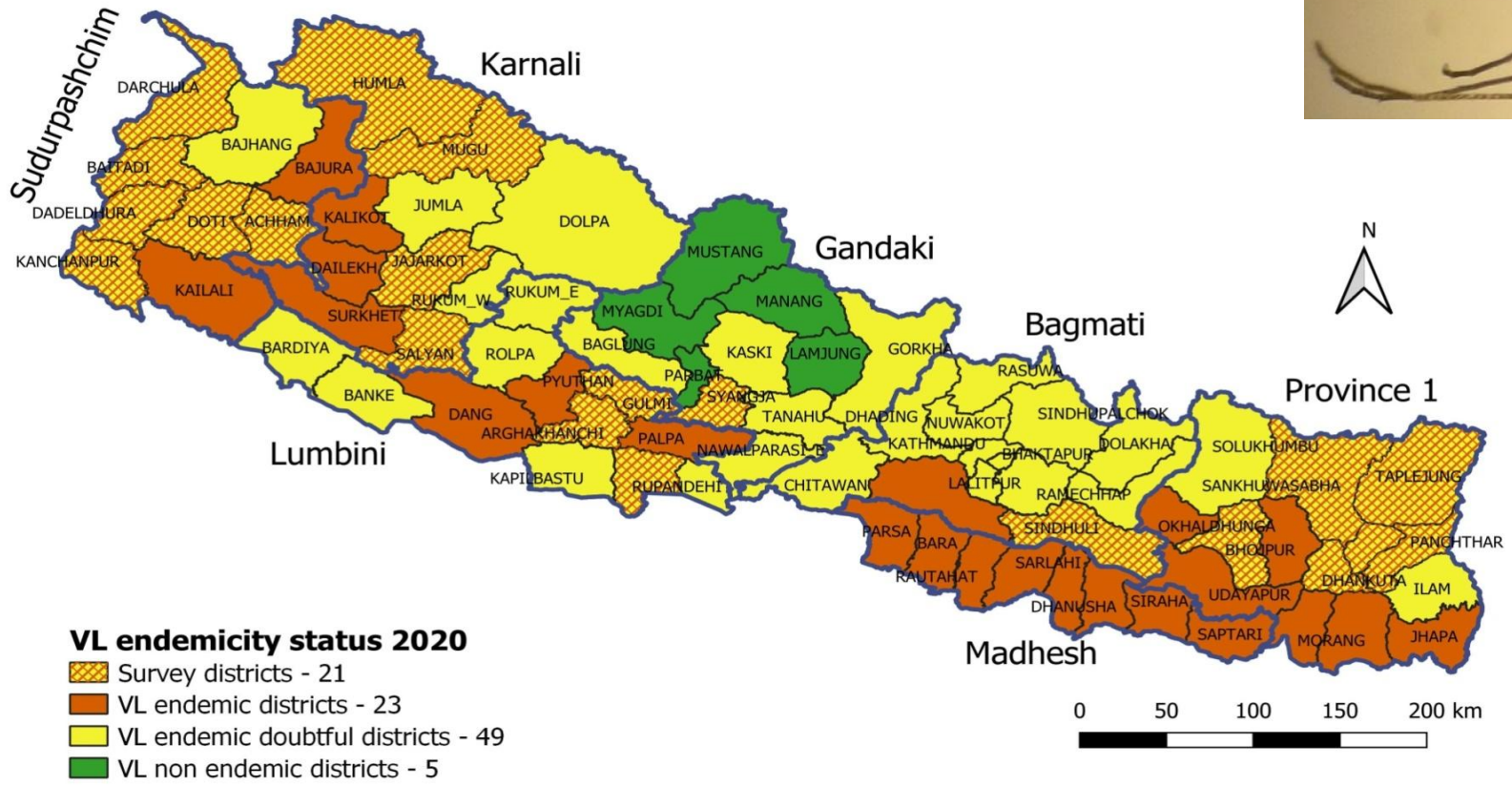
Other epidemiological arguments

- Kala-azar cases epidemiologically linked to other cases – 6.3% (4/64)
  - Clustering of the Kala-azar cases

- **Risk factors** for Kala-azar infection
  - Living with ex-Kala-azar cases in the same HHs/nearby (OR: 1.92; P-value: 0.041)
  - Travel history and exposure to known KA endemic areas/districts (OR: 1.42; p-value: 0.821)
  - Housing structure, ownership of livestock : no risk factors

Entomological findings

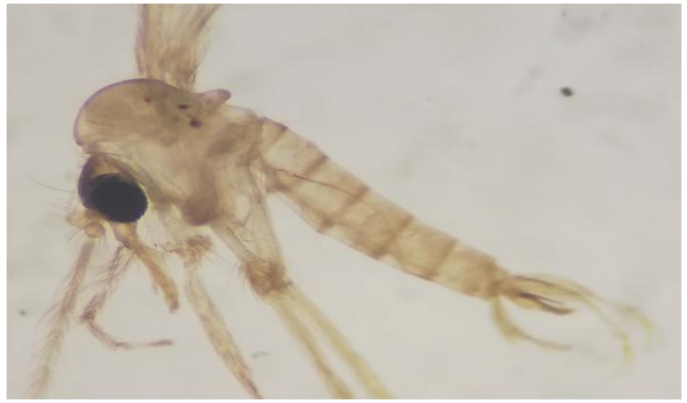
- ***Phlebotomus argentipes***

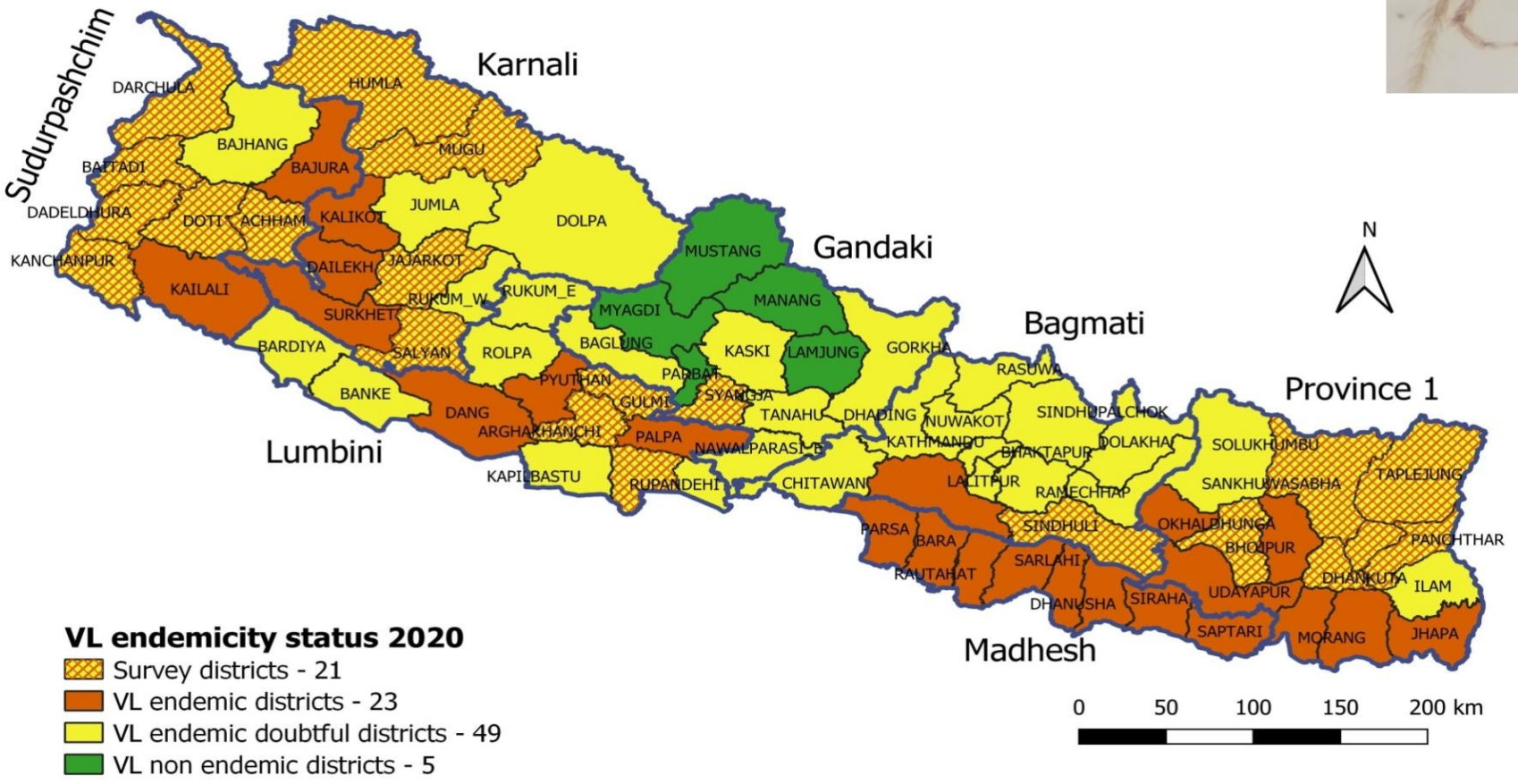


- Present in all districts except mountainous districts: **Humla and Mugu districts**
- Larger no. of collections in Kanchanpur (*n* = 212), Dadeldhura (*n* = 104) and Khotang (*n* = 104)

Entomological findings

- ***Phlebotomus (Adlerius) spp.***

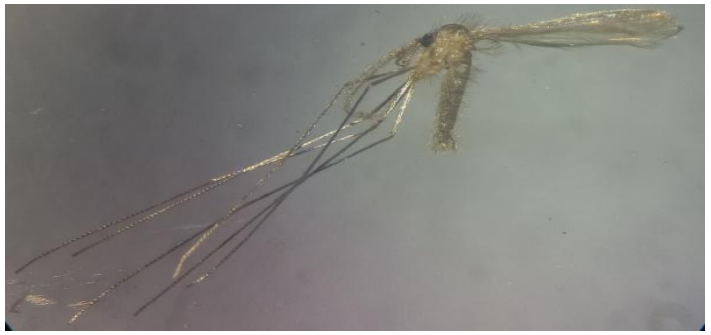


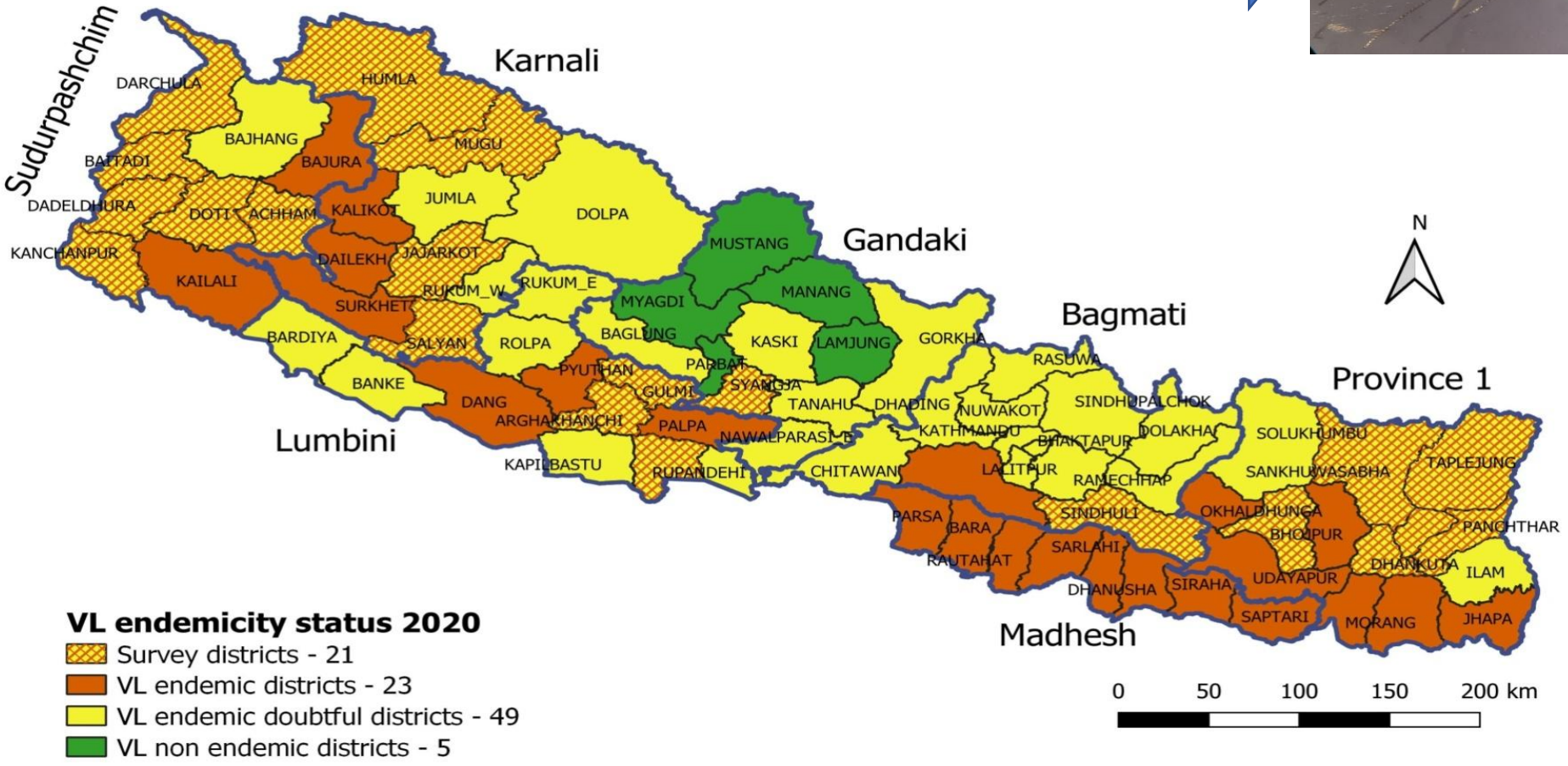


- Present in all districts except Dhankuta, Kanchanpur, Rupandehi, Sankhuwasabha, Sindhuli and Terhathum
- Larger number of collections in mountaneos districts: Mugu (n = 230), Humla (n = 83) and Baitadi (n = 82)

Entomological findings

- ***Phlebotomus major***

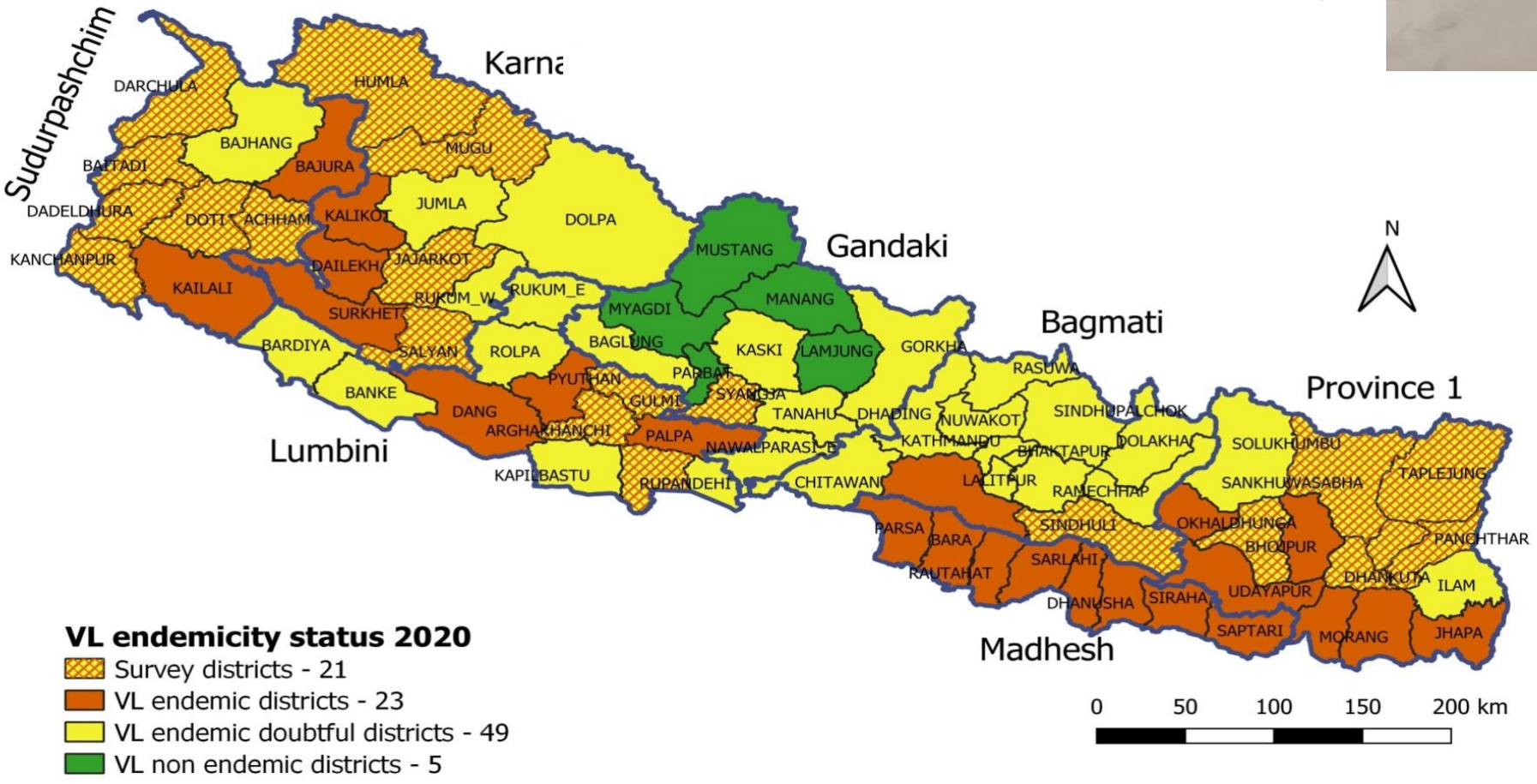




- Present in all districts except Kanchanpur and Rupandehi
- Larger number of collections in Mugu (n = 129) and Jajarkot (n = 128)

Entomological findings

- ***Phlebotomus* spp.**



- Present in six districts; Achham, Baitadi, Humla, Jajarkot, Panchthar and Taplejung
- Larger number of collections in Baitadi (n = 73) and Humla (n = 72)

Summary/conclusions:

- Provides strong evidence of local transmission of Kala-azar in previously classified *endemic doubtful districts*.
- Low-grade but ongoing transmission is indicated by:
  - Presence of clinically confirmed cases among non-travelers
  - Clustering of cases and epidemiological linkage within communities
  - Asymptomatic infections through serological and molecular methods
- The presence of competent sandfly vectors, in hilly and high-altitude regions, suggests a geographical expansion of transmission, possibly influenced by environmental or climatic changes.
- Nepal is on the verge of KA elimination by 2030. However, spreading endemicity is a major emerging threat.

Takeaway messages


तराईबाट पहाड चढ्दै कालाजार

दीपा दाहाल

काठमाडौं : ओखलढुंगा थापले ९ जानकारी स्वास्थ्य स्वयंसेविका ३६ वर्षीया मनमाया लिम्बू (नाम परिवर्तन) ले अस्पतालै रोगबारे जानकारी दिँदै स्वास्थ्य जीवन जिउन प्रेरित गर्ने काममा धेरै समय खर्चिन्। गाउँका महिलालाई सुत्केरी व्यथाले च्यापेपछि तत्काल स्वास्थ्य संस्था पुऱ्याउन हतार हुने उनलाई आफ्नै ६ वर्षीय छोरालाई रोगले च्यापेको थाहा पाउन भने धेरै समय लाग्यो।

ज्वरो आउने, पेट सुन्निने, कान्लेजस्ता समस्या बढ्दै गएपछि मात्रै ओखलढुंगा सामुदायिक अस्पताल पुऱ्याइएका उनका छोरालाई कालाजार भएको पुष्टि भयो। त्यसपछि थप उपचारका लागि धरानस्थित बीपी कोइराला स्वास्थ्य विज्ञान प्रतिष्ठान पुऱ्याइयो। कठिन उपचारपछि मात्रै ती बालकलाई बचाउन सफल भएको प्रतिष्ठानअन्तर्गतको ट्रपिकल एन्ड इनफेक्सियस डिजिज सेन्टरमा कार्यरत महामारी रोगविज्ञविद् सुरेन्द्र ढकाले बताए।

छोरो निको भएको केही दिन नबित्दै मनमाया बिरामी भइन्। उनलाई पनि कालाजार भएको पता लाग्यो। ओखलढुंगाकै मानेभन्ज्याङ६ का २३ वर्षीय भीमबहादुर सोपी (नाम परिवर्तन) लाई पनि

छिनछिनमा ज्वरो आउने समस्या देखियो। उनी सान्तोतिनै समस्या भन्दै सिटामोल खाएर बसे। तर तीन ज्वर शरीर काली

गएपछि भने उनी तुरुन्तै अस्पताल पुगे। उनलाई पनि कालाजार भएको पुष्टि भयो। परीक्षणका क्रममा उनको परिवारका अरू सदस्यलाई पनि कालाजार देखियो। एकदुईपटक मात्रै तराई झरेको उनीहरूको परिवार तराईमा मात्रै सीमित देखिँदै आएको कालाजारबाट प्रभावित भयो।

बाबुरा दहकोटका ६४ वर्षीय होमबहादुर विष्ट पनि कालाजार भएपछि लामो समय थला परे। उनलाई बाबुरबाट जम्मा तीनपटक तराई गएको सम्झना छ। धनगढी आएर लामो समय उपचार गरेपछि उनी बल्लतल्ल उठ्न सकेको हुन्।

तराईका विभिन्न १२ जिल्लाका विपन्न परिवारमा मात्र सीमित कालाजार रोग पछिल्लो समय पहाडी जिल्लाका बासिन्दामा पनि देखिने क्रम बढेको छ।

बाँकी पृष्ठ २

- Kala-azar is no longer confined to traditional endemic areas—there is clear evidence of spread to new ecological regions.
- Local transmission is occurring, not just imported cases.
- Urgent need to revise the national risk map and endemicity classification.
- Surveillance, early detection, and vector control activities must be expanded to newly affected areas.
- Strengthening elimination strategies is critical to prevent resurgence and achieve 2030 targets.

Acknowlegements

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Government of Nepal
Nepal Health Research Council

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