Discussion

- Two more challenges were identified: need for economic development in the community and for communications for advocacy in the community.
- There needs to be a shift in surveillance, from house-to-house/snowballing approach to integration into primary health care functions to increase the awareness of VL sustainably.
- Retaining staff expertise through continued training is needed.
- Sustainability requires continued funding.

3.4 SPEAK India: Outcomes and recommendations – Professor Mary Cameron, Professor of Medical Entomology, London School of Tropical Medicine

The SPEAK India consortium conducted operational research to address gaps and improve surveillance in the post-elimination era.

To determine whether serological surveys can be used as a tool to monitor (absence of) *L. donovani* transmission, a total of 15 426 samples were screened from people living in currently endemic, previously endemic and non-endemic villages, using rK39, DAT and rK39 ELISA diagnostic tests. All methods distinguished between currently endemic and previously/non-endemic clusters, and the rK39 test was the most sensitive and best suited for most of the age groups. Children reflected recent changes in transmission and represented a good target population for surveys. The total cost of the screening was US$ 49 355.

To improve VL surveillance at the PHC level, PHC staff interviewed former VL patients, registered one, three and five years ago, and screened them and their household members for VL, PKDL and leprosy (integrated active case detection). Data were collected via "ODK collect" on a smartphone. Of the 5618 householders examined (1093 former patients and 4525 contacts), three had VL, 46 PKDL and one leprosy. The total cost per household was US$ 9.30 in Bihar and US$ 22.00 in Uttar Pradesh (UP); the higher cost in UP was due to the lower disease burden requiring extra effort.

The xenomonitoring study showed that CDC light traps remained a more useful method for collecting a higher number of *P. argentipes* females than mechanical aspirators and collections had high incidental captures of female mosquitoes (useful for integrated vector surveillance). *Kdr* mutations were identified in sandflies, which may present a threat to the effectiveness of IRS. Two robust protocols to specifically detect *L. donovani* DNA in sandflies were developed but none of the pools, including those collected from currently endemic villages, was positive. The effort to collect sufficient female *P. argentipes* for *L. donovani* detection using qPCR was challenging and resource-demanding. A simple, point-of-need test to screen multiple pathogens transmitted by vectors is currently under development, which could represent a more viable method of integrated vector surveillance.

Mathematical models suggest that although VL cases are most infectious, as they resolve, PKDL becomes the major source and substantial risk of onward transmission. Using KAMIS case data, a short-term prediction model was developed to forecast outbreaks and trends in incidence to help efficient use of resources and to anticipate the demand of services at the block level. This could be integrated into routine surveillance. Another model, investigating spatial variation in delayed diagnosis of VL in Bihar, found that cases diagnosed in endemic blocks experienced shorter delays than those in areas affected less recently, implying that incidence-based targeting of ACD alone may not be sufficient going forward.

Discussion

- Alternative collection methods, such as cattle-baited traps, were found to collect higher numbers of *P. argentipes* in Sri Lanka.
- Collection methods should be selected according to the research question of the study and in the case of the SPEAK India study, looking at transmission to people in houses, CDC light traps and mechanical aspirators were selected.

3.5 Geospatial mapping of VL – a potential use in pre- and post-validation surveillance – Mr Prashant Hedao, GIS Consultant, WHO-HQ

The WHO GIS Centre of Health connects maps, apps, data and people to support countries to make informed public health decisions. Mr Hedao presented an example of geospatial mapping. It was based on the geocoding of VL cases reported since 2013 in India, and land use/land cover as well as human population estimates to demonstrate an example of geospatial mapping to potentially help case-based VL surveillance and response.

To illustrate the application of the approach, the following examples were also presented:

- Mapping where humans and snakes interact can be used to look at the risk of snake-bites in Nigeria.
- Geographical patterns and environmental factors are associated with the presence of human yellow fever in the Americas.
- Risk maps of VL in Ethiopia were developed based on epidemiological and meteorological data.

The GIS Centre of Health supports the following areas: mapping and visualization, geospatial reference data management, field data collection, monitoring, design and planning, geodata and analytics, constituent engagement and sharing and collaboration.

Main projects that benefited from their involvement in 2021–2022 include:

(1) Snake-bite Information and Data Platform (SIDP)

(2) Training and Capacity Development (TCD)

(3) AccessMod, Drive-time Analysis to Health Facilities

(4) GIS Software, Server and Baseline Data (SBD)

(5) Global Health Facilities Database (GHFD)