Policy Note

JICA Ogata Research Institute No.19
January 2026

Implementation of Rapid Diagnostic Kits for the Visualization of Rabies and Practice of a One Health Approach: Lessons from Field Application in the Philippines

Nobuo Saito*

SUMMARY

- In many rabies-endemic countries, the lack of an established diagnostic system has resulted in undetected rabies cases among animals, leaving large "silent zones" where the true infection status remains unknown. The "*visualization*" of infection is essential for implementing effective control measures.
- The JICA/AMED JAPOHR Project demonstrated that rapid diagnostic kits (Lateral Flow Devices; LFDs) have accuracy equivalent to the standard direct fluorescent antibody test and can be used safely and quickly in field settings. The introduction of LFDs enabled the detection of rabid animals even in areas where testing had not previously been conducted, thereby strengthening rabies control efforts at the local level.
- The introduction of LFD-based field diagnosis and a data-sharing system, together with the implementation of a One Health approach involving veterinary, public health, and community stakeholders, accelerated outbreak containment and further strengthened local response capacity.
- Priority actions include: (1) establishing and strengthening rabies diagnostic systems utilizing LFDs in endemic countries; (2) creating international certification and stable supply mechanisms for high-quality LFDs; and (3) institutionalizing rapid response systems under a One Health approach.

* Institute of Tropical Medicine, Nagasaki University Research Center for Global and Local Infectious Disease, Oita University

The views expressed in this publication are those of the author(s) and do not necessarily represent the official positions of either JICA or the JICA Ogata Research Institute.

1. Background: Diagnostic challenges leading to "silent zones" and the "cycle of neglect"

Rabies is a fatal infectious disease with an almost 100% case fatality rate once symptoms appear. However, it can be eliminated from endemic areas through effective control of dogs, including vaccination, population management, and rapid removal of rabid animals. Despite this, control measures have not sufficiently progressed in many countries. One of the main reasons is that rabies diagnosis remains highly complex, requiring specialized equipment and skilled personnel, making on-site testing difficult in most endemic settings.

As a result, diagnostic testing is rarely performed, and the actual situation of infection remains unknown in most rabies-endemic areas. This has created so-called "silent zones," which in turn reinforce a cycle of policy inattention and underinvestment in rabies control known as the "cycle of neglect."

The Science and Technology Research Partnership for Sustainable Development (SATREPS) is a joint research program implemented by JICA and AMED/JST that promotes international collaborative research to solve global issues through science and technology, while simultaneously contributing to capacity development in partner countries. The JICA/AMED SATREPS Japan and Philippines One Health Rabies (JAPOHR) Project, implemented under SATREPS, provided epidemiological evidence from the Luzon region of the Philippines. It found that diagnostic testing is concentrated near established laboratories, while it remains largely absent in remote areas (Mananggit et al. 2021).

To overcome this systemic challenge, it is essential to introduce simple diagnostic methods that do not rely on specialized facilities, enabling the rapid identification of infected dogs and the visualization of high-risk areas.

2. The Need for Rapid Diagnostic Kits and Barriers to Their Implementation

One promising approach to enable on-site rabies diagnosis is the use of rapid diagnostic kits known as lateral flow devices (LFDs). LFDs are simple-to-use tools that can deliver results quickly without requiring specialized equipment or highly trained personnel.

Professor Akira Nishizono of Oita University, in collaboration with Adtec Co., Ltd. (Oita, Japan), developed the *Rabies Ag Test*, a rapid diagnostic kit for rabies (Nishizono et al. 2008). This kit produces results in less than 15 minutes and is safe and inexpensive, making it highly suitable for field use in developing countries.

However, several challenges remain for the wider implementation of LFDs. First, scientific evidence regarding their diagnostic accuracy remains limited. Second, the test requires brain tissue samples, but conventional sampling involves opening the skull, which is difficult to perform under field conditions. Furthermore, some low-quality kits are already available on the market. Due to these issues, international organizations such as World Organization for Animal Health (WOAH) and the World Health Organization (WHO) had not yet endorsed the use of LFDs at the time the project was initiated.

The introduction of LFDs has the potential to fundamentally transform diagnostic capacity in

the field, and further accumulation of scientific evidence is needed to demonstrate their effectiveness.

3. Results of JAPOHR Project: Visualization through LFD Introduction and the Implementation of the One Health Approach

Through the introduction and field application of the LFD (*Rabies Ag Test*), the JAPOHR Project provided scientific evidence demonstrating that on-site rabies diagnosis is feasible and that visualization of infection status can function effectively under real-world conditions.

The project conducted comparative evaluations of several commercially available LFDs at local government laboratories in the Philippines and confirmed that the ADTEC kit demonstrated diagnostic accuracy equivalent to that of the standard direct fluorescent antibody test, scientifically validating its reliability for field use (Kimitsuki et al. 2020). Furthermore, combining the LFD with a simplified brain sampling technique (the straw sampling method), which does not require opening the skull, was found to enable safe and accurate on-site diagnosis (Mananggit et al. 2021). In addition, a large-scale evaluation conducted across 13 laboratories and 778 samples throughout the Philippines reaffirmed the high diagnostic accuracy of the LFD and highlighted the importance of regular training to maintain testing quality (Cruz et al. 2023).

The JAPOHR Project introduced LFD-based field diagnosis in Bulacan Province as a pilot implementation to evaluate its feasibility under field conditions. This field introduction enabled the detection of rabid dogs even in areas previously considered "silent zones," visualizing infection risks at the community level for the first time. Moreover, the introduction of the Rabies Data Sharing System (RaDSS), together with the implementation of a One Health approach involving veterinary, public health, and community stakeholders, accelerated outbreak containment and strengthened local response capacity (Saito et al. 2025).

This new system for diagnosis and information sharing has enabled the early detection of infected animals and rapid community-level responses, presenting a practical model that enhances the effectiveness of rabies control efforts.

Recommendation 4-1
Diagnostic systems for rabies should be established and strengthened through the use of LFDs.

Achieving rabies elimination requires a clear understanding—or "*visualization*"—of its true epidemiological situation. LFDs are a practical and effective tool that enables the rapid identification of rabid animals and the mapping of high-risk areas, even in regions where conventional diagnostic testing has been difficult to implement.

The JAPOHR Project scientifically demonstrates both the high diagnostic accuracy and the operational feasibility of LFDs under field conditions (Cruz et al. 2023; Mananggit, Manalo et al. 2021; Kimitsuki et al. 2020).

Based on this evidence, there is an urgent need to establish rabies diagnostic networks utilizing

LFDs—particularly in Asian and African rabies-endemic countries where diagnostic systems remain underdeveloped—and to promote the visualization of infection at the community level.

To achieve this, training programs for veterinarians and laboratory technicians should be developed, and institutional mechanisms must be introduced to ensure and maintain diagnostic quality.

Recommendation 4-2
International certification and a stable supply system for high-quality LFDs should be urgently established.

The high diagnostic accuracy of LFDs has been demonstrated through field studies by the JAPOHR Project, and sufficient evidence is now in place to establish international mechanisms for their standardization and quality assurance. However, a global system for the formal approval or certification of rabies diagnostic kits has not yet been fully established, and low- and middle-income countries (LMICs) may require technical support to conduct appropriate quality control in line with WOAH Rabies Reference Laboratory Network (RABLAB) recommendations. In addition, the small annual demand per country—typically only 3,000 to 5,000 tests—provides limited commercial incentives, resulting in uneven product availability and difficulties in securing a stable supply. Therefore, international mechanisms for both technical certification and pooled procurement are urgently needed to ensure consistent access to high-quality LFDs in endemic countries.

Consequently, a sustainable international supply and distribution network that covers multiple endemic countries must be developed. To achieve this, it is essential for international organizations such as WOAH and WHO to establish a technical certification system, alongside support schemes through international procurement and donation mechanisms.

Such a framework would secure the stable use of LFDs in endemic countries and enable the sustainable maintenance and strengthening of field diagnostic capacities.

Recommendation 4-3
A One Health approach for rapid rabies response should be institutionalized.

In many rabies-endemic countries, response systems have not been institutionalized, and when rabid animals are detected, veterinary authorities often handle the cases independently. As a result, coordination with public health and community sectors has remained weak, delaying the containment of outbreaks and reducing the overall effectiveness of control measures.

The JAPOHR Project implemented field diagnosis using LFDs and introduced a data-sharing system together with a One Health approach that connected veterinary, public health, and community stakeholders. These measures accelerated outbreak containment and strengthened local response capacity at the field level (Saito et al. 2025).

Moving forward, it is essential to strengthen this One Health response system so that veterinary, public health, and community stakeholders can act quickly and collaboratively when rabies cases

occur. To achieve this, roles and information-sharing mechanisms must be clearly defined, and legal frameworks and standardized operational procedures should be developed.

Institutionalizing such a One Health approach would not only enhance rabies control but also serve as a model for managing other zoonotic diseases in endemic countries.

References

Cruz, Jeffrey L., Alyssa M. Garcia, Nobuo Saito, Maria Glofezita O. Lagayan, Rainelda C. Dela Peña, Michael S. Usana, Steciousneil P. Agustin, Judith Z. Tattao, Christine V. Mamauag, Ofelia P. Ducayag, Heather Laxe F. Nabus, Princess Diana D. L. Flores, Ralph Joselle A. Fabon, Rogelio P. Peñaflor, Dave Christopher G. Viñas, Carla A. Limsan, Rona P. Bernales, Maria Erlinda T. Llames, Lerisa E. Balopeños, Ramir G. Morales, Ana Marie Cristina V. Migriño, Orfel June S. Calunsag, Josephine J. Datoy, Ken Y. Palma, Maria Corazon B. Sepulveda, Ma Noreen J. Eng, Jobienaur S. Moscoso, Sheena Mae F. Julabar, Jaira D. Mauhay, Mark Joseph M. Espino, Christine Joyce M. Javier, Kazunori Kimitsuki, and Akira Nishizono. 2023. "Evaluation of Lateral Flow Devices for Postmortem Rabies Diagnosis in Animals in the Philippines: A Multicenter Study." *Journal of Clinical Microbiology* 61 (12): e0084223. https://doi.org/10.1128/jcm.00842-23.

Kimitsuki, Kazunori, Nobuo Saito, Kentaro Yamada, Chun-Ho Park, Satoshi Inoue, Motoi Suzuki, Mariko Saito-Obata, Yasuhiko Kamiya, Daria L. Manalo, Catalino S. Demetria, Milagros R. Mananggit, Beatriz P. Quiambao, and Akira Nishizono. 2020. "Evaluation of the Diagnostic Accuracy of Lateral Flow Devices as a Tool to Diagnose Rabies in Post-Mortem Animals." *PLoS Neglected Tropical Diseases* 14 (11): e0008844. https://doi.org/10.1371/journal.pntd.0008844.

Mananggit, Milagros R., Kazunori Kimitsuki, Nobuo Saito, Alyssa Marie G. Garcia, Patricia Mae T. Lacanilao, Joely T. Ongtangco, Cornelio R. Velasco, Maria Victoria D. Rosario, Maria Glofezita O. Lagayan, Kentaro Yamada, Chun-Ho Park, Satoshi Inoue, Motoi Suzuki, Mariko Saito-Obata, Yasuhiko Kamiya, Daria L. Manalo, Catalino S. Demetria, Beatriz P. Quiambao, and Akira Nishizono. 2021. "Background and Descriptive Features of Rabies-Suspected Animals in Central Luzon, Philippines." *Tropical Medicine and Health* 49 (1): 59. https://doi.org/10.1186/s41182-021-00351-x.

Mananggit, Milagros R., Daria L. Manalo, Nobuo Saito, Kazunori Kimitsuki, Alyssa Marie G. Garcia, Patricia Mae T. Lacanilao, Joely T. Ongtangco, Cornhlo R. Velasco, Maria Victoria A. del Rosario, Maria Glofezita O. Lagayan, Kentaro Yamada, Chun-Ho Park, Satoshi Inoue, Motoi Suzuki, Mariko Saito-Obata, Yasuhiko Kamiya, Catalino S. Demetria, Beatriz P. Quiambao, and Akira Nishizono. 2021. "Lateral Flow Devices for Samples Collected by Straw Sampling Method for Postmortem Canine Rabies Diagnosis." *PLoS Neglected Tropical Diseases* 15 (12): e0009891. https://doi.org/10.1371/journal.pntd.0009891.

Nishizono, Akira, Pakamatz Khawplod, Kamruddin Ahmed, Kazuyo Goto, Seiji Shiota, Kumato Mifune, Takehito Yasui, Katsuyoshi Takayama, Yukuharu Kobayashi, Kazuaki Mannen, Veera Tepsumethanon, Chanarong Mitmoonpitak, Satoshi Inoue, and Kinjiro Morimoto. 2008. "A Simple and Rapid Immunochromatographic Test Kit for Rabies Diagnosis." *Microbiology and Immunology* 52 (4): 243–49. https://doi.org/10.1111/j.1348-0421.2008.00031.x.

Saito, Nobuo, Patricia T. Lacanilao, Alyssa M. Garcia, Karren L. Inton, Jaira D. Mauhay, Voltaire G. Basinang, Lea G. Fernando, Benedict T. Bernardo, Roel G. Dela Cruz, Arvin H. Agapito, Arby B. Banaag, Gladys M. Bernardo, Jonarel M. Andres, Geraldine M. San Juan, Edwin P. Tecson,

Annie M. Balingit, Joely T. Ongtangco, Maria G. Lagayana, Jeffrey L. Cruz, Shella G. Oridinario, and Akira Nishizono. 2025. "LFD Implementation Uncovers Hidden Rabies Burden: Pre- and Post-Implementation Analysis and Comparison with Non-Implementation Sites in the Philippines." *One Health 21* (December 2025): 101281. https://doi.org/10.1016/j.onehlt.2025.101281.

Contact:
JICA Ogata Sadako Research Institute for Peace and Development
10–5 Ichigaya Honmura–cho Shinjuku–ku Tokyo 162–8433, JAPAN
TEL: +81–3–3269–2357 FAX: +81–3–3269–2054
URL: https://www.jica.go.jp/jica-ri/index.html