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Navigating Leptospirosis Risk: Experiences and Perspectives of Rural Residents in Endemic Communities

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Abstract

Leptospirosis is a zoonotic bacterial infection sustained by interactions among animals, people, water, soil, and the built environment. Rural residents in endemic communities often encounter these interfaces during farming, animal care, fishing, waste handling, travel through waterlogged areas, and post-flood cleaning. This evidence-informed narrative article examines how residents understand and navigate leptospirosis risk by synthesizing international guidance and published community research. The literature indicates that awareness of the disease does not automatically produce consistent prevention. Local labels such as “rat urine disease” can make the illness recognizable while narrowing understanding of other reservoirs and exposure routes. Repeated contact without an identified illness may normalize danger and foster a sense of immunity. At the same time, protective boots, gloves, wound coverings, chemoprophylaxis, and early care-seeking may be constrained by discomfort, cost, uncertain instructions, medicine availability, transport, wage loss, and weak confidence in health services. Household action is further limited when open drainage, flooding, waste accumulation, rodent habitats, and unsafe water require collective or governmental solutions. Effective prevention therefore depends on more than information campaigns. Facilitators include dialogue in local languages, trusted health workers and community leaders, seasonally timed risk communication, affordable and work-compatible protective options, dependable access to indicated prophylaxis and clinical care, community-led environmental action, and coordinated One Health services. Programmes that respect residents’ knowledge and economic realities can convert awareness into feasible, sustained protection.

Keywords: *leptospirosis; rural communities; lived experience; risk perception; prevention; health-seeking; One Health*

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Introduction

Leptospirosis is caused by pathogenic Leptospira bacteria. Humans are commonly infected when abraded skin or mucous membranes contact the urine of infected mammals or soil and water contaminated by that urine. Rodents are important reservoirs, but livestock, dogs, and other mammals may also participate in transmission. Infection can range from a mild febrile illness to jaundice, kidney injury, pulmonary haemorrhage, meningitis, and death. Because early symptoms resemble other tropical fevers, delayed recognition is common (World Health Organization [WHO], 2003).

The burden is concentrated in tropical settings where heavy rainfall, flooding, inadequate drainage, poverty, animal contact, and outdoor work converge. Global estimates indicate substantial mortality and disability, particularly in resource-constrained populations (Torgerson et al., 2015). In India, national guidance identifies agricultural labourers, sewage workers, animal handlers, and people exposed during floods as groups requiring focused prevention, surveillance, and timely clinical management (National Centre for Disease Control [NCDC], 2015). Eco-epidemiological evidence likewise shows that infection is produced by combinations of occupation, household conditions, animals, rainfall, and proximity to water rather than by a single isolated behaviour (Lau et al., 2016).

For this reason, prevention cannot be understood only as a list of instructions. Rural residents continually interpret whether a place is dangerous, whether protection is practical, whether symptoms justify travel to a clinic, and whether official advice fits everyday life. This article synthesizes published qualitative and community-based evidence to describe those experiences and perspectives. It is a narrative synthesis, not a report of new interviews; no participant quotations or original findings are presented.

How Rural Residents Construct Leptospirosis Risk

Community knowledge is often assembled from local illness names, media reports, conversations, memories of outbreaks, and the experiences of relatives or neighbours. In Malaysian focus groups, the familiar expression “rat urine disease” improved recognition but also encouraged an incomplete explanation in which rats were treated as the only relevant reservoir (Sukeri et al., 2018). Such shorthand may obscure livestock exposure, contaminated mud, entry through the eyes or mouth, and the risk associated with apparently clean water.

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Surveys from Trinidadian households and Brazilian communities similarly identified gaps in knowledge of symptoms, transmission routes, and preventive measures (Mohan & Chadee, 2011; Navegantes de Araujo et al., 2013).

These gaps do not mean that rural residents are indifferent or incapable of understanding risk. They show that information is interpreted through existing experience. A person who has worked barefoot in paddy fields for years without a diagnosed infection may consider the activity familiar rather than hazardous. Someone who associates leptospirosis only with visible rats may not connect fever with floodwater, cattle urine, or a small unnoticed abrasion. Effective communication must therefore begin with residents' current explanations, identify what is accurate, and respectfully expand the causal picture.

Risk Normalization and Perceived Invulnerability

Repeated exposure can make risk feel ordinary. Muddy fields, stagnant roadside water, livestock sheds, rodents, and seasonal flooding may be viewed as unavoidable features of place and work. When no immediate illness follows exposure, experience can appear to contradict health warnings. Qualitative research in Malaysia found that respondents could regard leptospirosis as severe while believing that they personally were unlikely to acquire it (Sukeri et al., 2020). This combination reduces motivation: the disease is frightening in theory but distant in personal terms.

Recent qualitative work in rural Sri Lanka identified limited knowledge, false interpretations, poor preparedness, economic constraints, weakened social support, and community-level health-system problems as interconnected sociocultural influences (Udayanga et al., 2024). The implication is important. Risk perception is not corrected by fear alone. Messages must help residents connect specific local activities and recent exposure to personal susceptibility, while also offering realistic actions that preserve dignity and livelihood.

Livelihood, Practicality, and the Cost of Protection

For many rural households, the highest-risk activities are also the source of food and income. Paddy work, livestock care, fishing, drainage cleaning, waste handling, and flood recovery cannot always be postponed. Advice to "avoid contaminated water" may therefore be impossible to follow. Protective equipment can also conflict with the task: boots may trap water or mud,

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gloves may reduce grip, and heavy materials may be uncomfortable in heat. Replacement costs compete with transport, food, seed, animal feed, and school expenses.

Research among Sri Lankan farmers illustrates this gap between recommendation and feasibility. Although awareness of doxycycline prophylaxis was high in one study, correct knowledge and sustained use were much lower; reported barriers included perceived immunity, low motivation, supply problems, concerns about adverse effects, and preference for other remedies. All participating farmers considered boots impractical during paddy cultivation (Fonseka et al., 2019). Other farmer research has likewise shown that satisfactory knowledge and attitudes do not necessarily translate into preventive practice (Dhanasinghe & Gamage, 2024). Rural adolescents may recognize agricultural risk while reporting limited use of boots and gloves, suggesting that patterns of exposure and feasibility begin early (Samarakoon & Gunawardena, 2013).

These experiences caution against labelling non-adherence as carelessness. A resident may accept the health message but reject the proposed action because it is unaffordable, unavailable, uncomfortable, or incompatible with work. Programmes should test equipment with users, subsidize suitable designs, establish local replacement supplies, and present chemoprophylaxis only through current clinical guidance with clear eligibility, dosing, contraindication, and follow-up instructions.

Living with Environmental and Collective Risk

Individual cleanliness has limited power when exposure is created by shared infrastructure. Open drains, accumulated waste, waterlogging, unsafe storage, damaged roads, inadequate sewage systems, and rodent harbourage can sustain contamination beyond the control of one household. Prospective evidence from a highly exposed Brazilian community linked repeated infection with poverty and proximity to open sewers, demonstrating how environmental conditions reproduce risk (Felzemburgh et al., 2014). Although that setting was urban, the underlying mechanism is relevant to rural settlements with flood-prone paths, irrigation channels, livestock runoff, and irregular waste collection.

Residents may become discouraged when they repeatedly clean their compounds but neighbouring waste sites or public drains remain unchanged. Conversely, studies in riverside settlements suggest that knowledge can support safer practice when people have meaningful

opportunities to act (Ricardo et al., 2018). Prevention therefore becomes credible when household efforts are matched by reliable waste removal, drainage maintenance, safe water, rodent management, and rapid post-flood assistance.

Symptoms, Care-Seeking, and Trust in Services

The decision to seek care is another form of risk navigation. Early fever, headache, or muscle pain may be interpreted as fatigue, influenza, dengue, or an illness that will resolve. Travel distance, transport cost, lost wages, caregiving responsibilities, and previous experiences of long waits can encourage delay. Residents may also omit an exposure history unless clinicians ask specifically about farming, animals, mud, floodwater, and wounds. In turn, an uncertain diagnosis or conflicting advice can weaken confidence in later campaigns.

Community education should therefore pair symptom awareness with a simple action pathway: when to seek care, where to go, what recent exposures to report, and why early treatment matters. Primary-care teams need consistent triage prompts during rainy seasons and after floods. Visible readiness at the facility—trained staff, referral arrangements, diagnostic access, and respectful communication—makes prevention messages believable. Community knowledge studies show that hearing of the disease is not equivalent to knowing its manifestations or complications, reinforcing the need for specific and repeated guidance (Nozmi et al., 2018).

Facilitators of Feasible and Sustained Prevention

Trusted communication is a central facilitator. Rural health nurses, community health workers, public health inspectors, agricultural officers, veterinarians, teachers, farmer associations, women's groups, and local leaders can translate technical guidance into locally meaningful choices. Short demonstrations, pictures, local-language audio, and discussion of familiar sites are more actionable than generic warnings. Communication should be timed before agricultural and monsoon peaks, repeated during floods, and continued after media attention declines.

Material support must accompany education. Communities need work-compatible boots and gloves, waterproof wound coverings, washing facilities near fields, safe drinking water, dependable access to clinically indicated prophylaxis, and affordable transport to care.

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Distribution points can be aligned with farmer meetings, local clinics, markets, or disaster-relief centres. Residents should be invited to report why an item or service is not being used, and programmes should treat that feedback as design evidence rather than resistance.

Collective action further strengthens individual protection. Participatory risk mapping can identify waterlogged routes, waste sites, rodent habitats, animal areas, and households needing assistance. Community clean-up and secure food storage are useful when local authorities simultaneously repair drainage, remove waste, and support rodent control. Because human infection reflects animal, environmental, and health-system conditions, prevention should follow a One Health model linking public health, primary care, veterinary services, agriculture, sanitation, and disaster management.

Social networks are also part of prevention infrastructure. Neighbours can warn one another about contaminated routes, share transport, assist older adults after floods, and normalize early care-seeking. Farmer groups can coordinate work schedules, protective-equipment purchases, and access to preventive services. Yet participation should not depend only on unpaid volunteers or already influential households. Women, adolescents, migrant workers, people with disabilities, and landless labourers must be included because their exposure, decision-making power, and resources may differ. Transparent responsibilities, small local budgets, feedback channels, and visible government follow-through help convert social solidarity into dependable protection. When residents see reported hazards resolved, trust grows; when reports disappear without action, future engagement weakens.

Implications for Community Health Nursing and Public Health

Community health nurses are well placed to connect household experience with institutional response. Assessment should extend beyond whether residents have heard of leptospirosis. Nurses can explore local names, perceived sources, high-risk tasks, prior illness, barriers to protective equipment, medicine concerns, preferred information channels, and access to care. This information can guide micro-plans for villages, occupational groups, and flood-affected neighbourhoods.

Education should be interactive and competency-oriented. Residents can demonstrate how to cover abrasions, remove contaminated clothing, wash after exposure, store food securely, and describe the exposure information to give a clinician. A brief teach-back check reveals

misunderstanding more effectively than attendance records. Families should also know that severe illness can develop after an apparently minor exposure and that early medical evaluation is important.

Programme evaluation should measure practical outcomes: availability and consistent use of suitable protection, time from symptom onset to care, prophylaxis access and correct use where officially indicated, participation in environmental action, and resolution of reported hazards. Equity must remain central. Landless workers, older adults, women performing animal care, adolescents helping in fields, migrant labourers, and households distant from services may experience different constraints. Sustainable prevention is achieved when residents can protect themselves without sacrificing income, safety, or trust.

Conclusion

Rural residents navigate leptospirosis risk through a continuous negotiation among knowledge, past experience, livelihood, environment, and trust. Awareness alone is insufficient when exposure is normalized, personal susceptibility feels low, equipment is impractical, services are inconsistent, or neighbourhood hazards remain unresolved. Published evidence supports prevention that listens before instructing and couples individual guidance with material and structural support. Locally trusted communication, feasible protective options, early-care pathways, community participation, and coordinated One Health action can transform leptospirosis prevention from an abstract recommendation into a realistic part of rural life.

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