Table 2 Important secondary investigations to describe key characteristics of novel pathogens

Key questions	Investigations/Studies
Transmissibility • Period of infectivity and duration of viral shedding • Serial interval • Ro (basic reproductive rate) • Secondary attack rate • Mode of transmission and types of exposure	Outbreak investigations including: • Investigations of contacts in health-care settings, households, other institutions. Define attack rates based on exposures within the institutions, time intervals from last exposure to onset of illness. Define types of exposures based on surveys. Use serology in addition to PCR/culture to identify mild and asymptomatic cases. • Community transmission studies. Rates of increase in outpatient visits and admissions to hospital. Phone surveys to monitor rates of change in illness in the community • Enhanced syndromic surveillance • In the event of widespread community transmission, serological surveys before and after transmission (may need to identify archived pre-transmission sera) • Serial testing of confirmed cases to determine duration of viral shedding • Animal studies of transmission and shedding
Clinical presentation and course	Detailed chart review with data extraction: • Signs, symptoms, laboratory and X-ray findings at initial presentation of confirmed cases • Risk factors for severe vs mild infection • Course of illness including changes in key laboratory parameters, development of complications and interventions needed • Duration of illness • Follow-up of patients for long term sequelae • Development of case definition.
Clinical management best practices	Detailed chart review documenting treatment modalities and outcomes
Morbidity, mortality and case-fatality rate	• SARI surveillance data • Hospital/ICU trend data on pneumonia (perhaps also renal or multi-organ failure) • Pneumonia and influenza mortality rates • All-cause mortality rates • Proportion of probable and confirmed cases that die • Proportion of admitted cases that die • Serological survey of exposed population to determine attack rate • Community death surveys
Source of virus	Animal studies to identify reservoir: • Animal capture surveys • Surveys of markets, farms, etc. • Testing of archived materials from animal diagnostic laboratories, food and importation screening
Laboratory diagnosis, sensitivity and specificity • Define different PCR targets to be used according to type of specimen and timing from onset of illness. • Development of sensitive and specific serological test	• Validation of PCR sensitivity/specificity • Best specimen for testing • Best timing of collection • Production of control material • Serological testing of symptomatic cases with comparison to PCR/culture from multiple sites (e.g. nasopharyngeal, oropharyngeal, sputum, lower airway, stool) • Community serosurveys and/or seroprevalence in stored sera
Virological characteristics • Duration of survival in environment and viability • Receptor distribution • Genetic characterization: degree of variation between viruses, relatedness to other viruses • Sensitivity to disinfectants • Antiviral sensitivity	• Laboratory characterization • Comparison of genomic sequences • Viral culture in range of cells from different species

ICU – intensive care unit; SARI – Severe Acute Respiratory Infection; PCR – polymerase chain reaction