02/14

New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction

Welcome to the 18th edition of the *New Brunswick Disease Watch Bulletin*.

In this volume, we examine recent developments with respect to two emerging respiratory diseases – the H7N9 virus and MERS-CoV, and provide a summary of key action steps for clinicians. We have also included an article on working together to improve influenza vaccine uptake. This issue also includes an overview of the New Brunswick Sentinel Practitioners Influenza Network (SPIN), with contact information if you are interested in participating. There is a short message on the health concerns of radon exposure and how to test for it in your residence. There is a summary of the heart health report that was released by the Chief Medical Officer of Health in September 2013.

Moreover, we provide information on why energy drink use among youth is a public health concern with an update from a recent stakeholder dialogue on energy drinks the Department hosted October 1, 2013.

Energy drink use among youth is a public health concern

Energy drinks are beverages that contain moderate to high concentrations of stimulant drugs, chiefly caffeine. Other ingredients commonly found in energy drinks include sugar, guarana, B vitamins, and herbs. Their consumption has risen steadily in North America in the last decade and they are particularly popular among young people owing to their purported ability to enhance mental and physical energy.[1] The Office of the Chief Medical Officer of Health (OCMOH) has been aware of the increased concerns from parents, community groups and healthcare providers in New Brunswick about the use of energy drinks by children and youth.

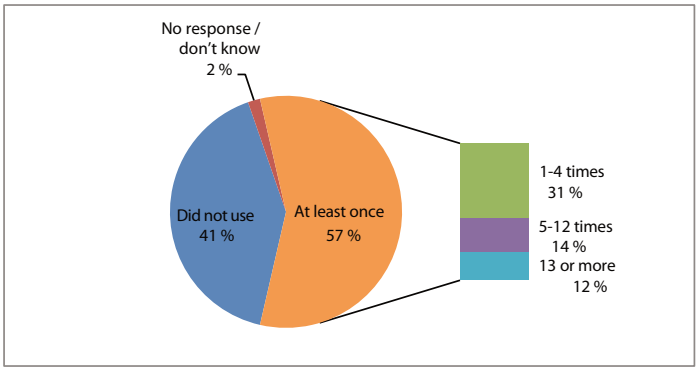
Energy drink consumption by children and youth are of concern for multiple reasons. Unlike sports drinks meant to replenish fluids lost in exercise, energy drinks contain neuroactive substances and offer no therapeutic benefits; they are associated with increased risk of adverse health effects such as anxiety, nausea, headache, insomnia, irregular heartbeat, heart attack and, very rarely, death.[2, 3]

Energy drink use in New Brunswick

Until recently, little was known about adolescents' consumption of caffeinated energy drinks in New Brunswick. New findings from the New Brunswick Student Drug Use Survey (NBSDUS) 2012 help fill data gaps to improve understanding of consumption patterns and risk characterization among New Brunswick youth.[4]

The NBSDUS 2012 surveyed students in Grades 7, 9, 10, and 12 between the ages of 11 and 19 and found that more than half (57.2%) of these students used energy drinks in the past year (Figure 1). No appreciable differences were found in the consumption rates by health region, which stood between 54 and 61 per cent. High school students (Grades 9, 11 and 12) were more likely to consume these beverages compared to those in middle school (Grade 7) (Figure 2). Within the high school level, consumption rates were similar across grades. The survey also indicates that males are more likely to use energy drinks than females. The analysis shows a strong association between consumption of energy drinks and of alcohol among students.

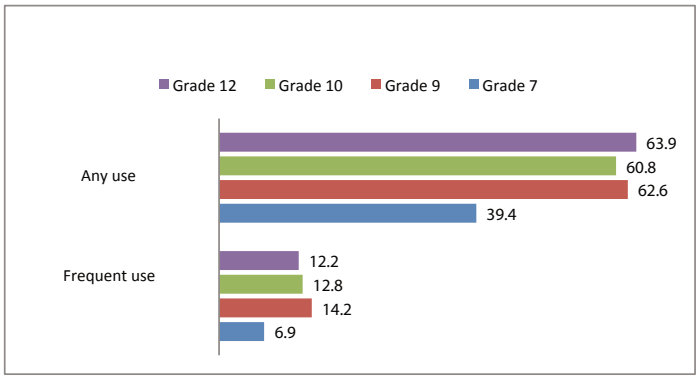
Figure 1: Percentage of adolescent students reporting use of caffeinated energy drinks in the past 12 months, by frequency of use, New Brunswick, 2012



Note: Data captured self-reports from a representative sample of students in grades 7, 9, 10 and 12. Don't know / no response = does not know what are caffeinated energy drinks / did not respond to the survey question.

Source: Office of the Chief Medical Officer of Health, using data from the New Brunswick Student Drug Use Survey 2012 (sample size: 3507).

Figure 2: Percentage of adolescent students using caffeinated energy drinks in the past 12 months, by grade, New Brunswick, 2012



Note: * = statistically lower than the rate for students in grade 12 ($p<0.05$). Any use refers to consuming any energy drinks in the past 12 months. Frequent use refers to consuming more than 12 times in past 12 months.

Source: Office of the Chief Medical Officer of Health, using data from the New Brunswick Student Drug Use Survey 2012.

Current regulations and recommendations

In 2011, Health Canada began regulating energy drinks as food products. Before 2011, energy drinks were considered Natural Health Products. Certain products, such as energy shots, are still regulated as Natural Health Products. Food product regulations require that energy drinks include a Nutrient Facts Panel and ingredient list on the label. All energy drinks must include warning statements on product labels indicating that the product is not intended for children, pregnant or breastfeeding women or persons sensitive to caffeine and that the product should not be mixed with alcohol.[5] In addition to this, Health Canada has required that energy drinks adhere to specific product formulation requirements (i.e. maximum levels of caffeine and restricted ingredient list). Under these regulations, a single-serve or non re-sealable container must not exceed 180 mg of caffeine.

Health Canada recommends that the maximum daily intake of caffeine for children under 12 should not exceed 2.5 mg/kg of body weight. For an average weight 10 to 12 year old that would amount to 85 mg of caffeine/day. The same maximum daily intake of 2.5 mg/kg of body weight is suggested for adolescents. The daily limit of caffeine for healthy adults is 400 mg/day which is roughly the equivalent of three - eight -ounce cups of brewed coffee.[6]

Stakeholder dialogue on energy drinks

On October 1, 2013, the Department of Health hosted a one-day stakeholder dialogue to learn

Key points for healthcare providers to remember:

- Health risks associated with energy drink consumption include sleep disturbances and insomnia, fatigue, nausea, headache, irregular heart rate and palpitations, increased blood pressure, diuresis and hyperglycemia
- Energy drinks are not recommended for children, pregnant or breastfeeding women and people sensitive to caffeine.
- Youth may be consuming energy drinks in combination with alcohol or other drugs.
- The maximum daily intake of caffeine for children and youth is 2.5 mg/kg body weight/day.
- The daily limit of caffeine for healthy adults is 400 mg/day.
- Ensure that parents are aware of the health risks associated with energy drink consumption during childhood and adolescence.

about and discuss the risks associated with energy drink use among children and youth. Stakeholders from a wide variety of sectors were invited by the Minister of Health to attend the dialogue session. Over 120 representatives from education, sport and recreation, health charities, professional associations, regional health authorities, provincial and federal government departments, youth groups, industry, students, First Nations, universities, and law enforcement attended the event.

The morning consisted of panel presentations from the OCMOH, Health Canada, Dr. Michael Dickinson, the Canadian Beverage Association and Southern Victoria High School. The presentations provided a broad overview of the current regulatory system in Canada, what evidence exists and where the gaps are, what the main health concerns are for children and youth, and an example of action at a community level.

Dr. Michael Dickinson, head of pediatrics at Miramichi Regional Hospital, discussed his concerns about adolescents using energy drinks. He said, "Not much is known about the effects high doses of caffeine might have on the developing brain and body of a teenager. Particularly worrisome is the fact that the naturally high levels of hormones found in healthy teens seem to decrease caffeine metabolism, making adolescents particularly susceptible to caffeine side effects and overdose." Dr. Dickinson shared that he now asks young patients about energy drink use if they are presenting with certain symptoms such as insomnia, fatigue, nausea, headache, and heart palpitations. He also stated that healthcare professionals need to be aware that youth may be combining energy drinks with alcohol or other drugs.

By the end of the dialogue, there were four main themes that had emerged from the conversations: research, education and awareness, regulation and legislation, and engagement. A summary report of the dialogue event is being prepared and will be made available later this fall on the OCMOH website.

Next steps

Energy drink consumption by children and youth is a health concern that does not appear to be going away. There are roles for many sectors to play in reducing the health risks for children and youth. Ongoing research to better understand the effects of energy drinks on children and youth, engaging youth in research and discussions about consumption and access, increasing education and awareness across many sectors (i.e. healthcare providers, educators, parents, retailers) and exploring additional regulatory approaches are all ideas that were identified during the stakeholder dialogue. It was clear that a multi-faceted approach and collaboration across sectors will be paramount in increasing awareness and reducing the health risks associated with energy drink consumption.

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[6] Health Canada, It's your health: Caffeine (http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/food-aliment/caffeine-eng.php, accessed October 18, 2013).

Heart Health in New Brunswick

Heart disease is one of the leading causes of hospitalization and a major contributor to health care costs in this province. While the incidence is decreasing, the demands on our health care system remain high because of a higher overall prevalence as people are living longer with the disease. With the expected rapid increase in the proportion of seniors in New Brunswick in the coming years, and increases in rates of Type 2 diabetes and obesity, the evidence is inconclusive as to whether the declining trend in incidence will continue in the future. The Department of Health's Chief Medical Officer of Health released a report in September that provides an overview of heart disease in New Brunswick and discusses a comprehensive approach to heart health. Understanding the complexity of heart health, disease trends and associated risk factors for heart disease and poor heart health are essential to plan effective and comprehensive ways to address the problem. The main purpose of *The State of Public Health in New Brunswick 2013: Heart Health* is to start a discussion on how to better understand and address the underlying factors that contribute to poor heart health, and to stimulate new questions and innovative actions to enhance disease prevention efforts among a broad range of stakeholders within and outside the health sector. The report can be downloaded at http://www2.gnb.ca/content/gnb/en/departments/ocmoh/publications.html.

Radon exposure awareness and health

Radon is a colorless, odorless, radioactive gas that occurs in the environment. It results from the natural breakdown of uranium in the soil. Radon can accumulate in enclosed spaces such as homes to levels that can be considered to be a health hazard. Exposure to elevated levels of radon has been mostly associated with an increased risk of lung cancer. The risk depends on the concentration of radon, the duration of exposure, and a person's smoking habits.

According to Health Canada statistics, radon exposure is the second leading cause of lung cancer after smoking.[1] Exposure to radon and tobacco use together can significantly increase the risk of lung cancer – thus their combined effect is synergistic. For example, a lifelong smoker has a risk of contracting lung cancer of one in eight. If you add exposure to a high level of radon, the risk becomes one in three. The risk of lung cancer for a non-smoker exposed to the same high radon level is one in twenty.

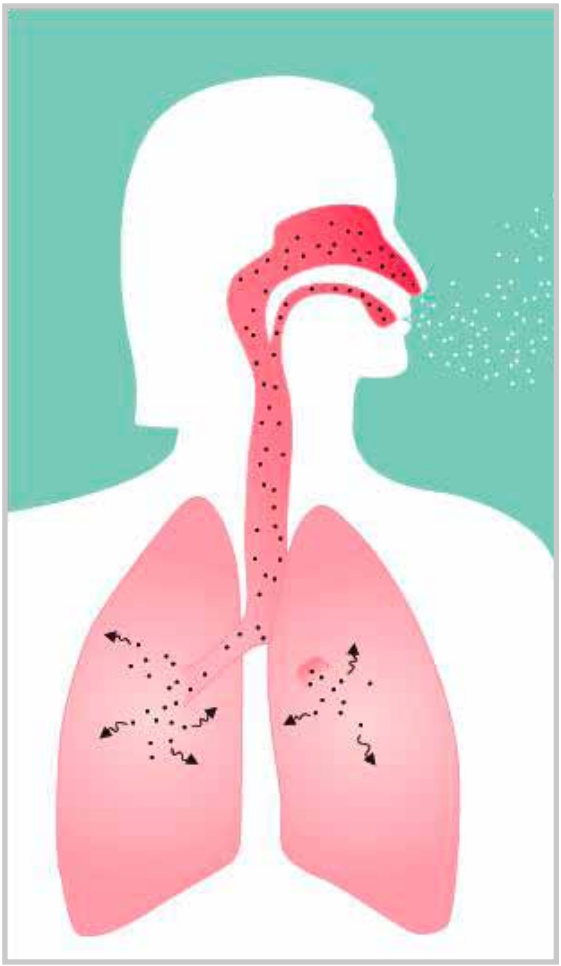
The only way to detect radon is through testing. Radon testing is relatively simple and inexpensive. Radon test devices can be purchased through the New Brunswick Lung Association (www.nb.lung.ca) or at a variety of laboratories and some home improvement retailers. They are also available for purchase over the internet.

It is recommended to test homes during the heating months between October and April, when doors and windows are usually kept more often closed, leading to higher radon levels during that period. If test results are high (above 200 Bq/m3) a number of measures which have proven to be successful can be implemented to reduce the levels.

Action pointers for Health Care Practitioners:

- Counsel patients about the risk of radon.
- Counsel patients about smoking cessation and refer them to appropriate services, if needed.
- Encourage patients to test their residence for radon and refer them for information about testing and remedial actions if needed.

For more information, visit the GNB website www.gnb.ca/health *or the Health Canada Web site* www.healthcanada.gc.ca.



Source: © All rights reserved. Radon: Is it in your Home? Health Canada, 2013. Reproduced with permission from the Minister of Health, 2013.

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New Brunswick's Immunization *Partners in Protection*: Working Together to Improve Influenza Vaccine Uptake

New Brunswick's publicly funded influenza vaccines are delivered through a network of immunization providers including physicians, pharmacists, nurse practitioners, and nurses through various programs. New Brunswick's immunization partners work together to increase public awareness of the benefits, safety and effectiveness of influenza immunization.

Did you know that? . . .

- During the 2012-13 flu season, the New Brunswick Central Serum Depot distributed **239,920 doses** of publicly funded influenza vaccine to the various immunization providers across the province.
- The World Health Organization (WHO) and the National Advisory Committee on Immunization (NACI) recommend that 90% of health-care providers (HCPs) be immunized to reduce the number of people suffering complications and dying from influenza.[1]
- Influenza vaccination provides benefits to health care workers (HCWs) and to the patients for whom they care.[2]
- Despite known benefits of influenza vaccination, inoculation rates among HCPs remain low. Current influenza immunization rates in Canadian healthcare organizations range from 40%-60% - well below the recommended target.[1] Suboptimal vaccination rates among HCPs are of particular concern as unvaccinated personnel can act as transmission vectors to high-risk patients.[3]

Strategies to Improve Vaccine Uptake

Government, health professional organizations, healthcare agencies and healthcare providers all need to use a variety of interventions collaboratively and complementarily, to improve vaccine uptake by healthcare workers and the population – particularly those at higher risk of contracting vaccine-preventable infections or suffering their complications. Here are suggested strategies for HCPs motivated to make a difference:

- HCPs can increase general influenza vaccine knowledge in the community. HCPs need to play an important role in the education of their patients and families about influenza vaccination. They should be conscious that they are often viewed as role models.[3]
- HCPs need to remain updated on the latest advances in immunization. They are seen as credible sources of information on influenza immunization for their patients, other healthcare workers and the general public.
- Immunizers can make it more convenient for patients and healthcare workers to access vaccines by diversifying the locations and time periods where and when vaccination is accessible. In recent years, it has become easier to get the flu shot through a maximization of services delivered through a network of varied immunization providers.

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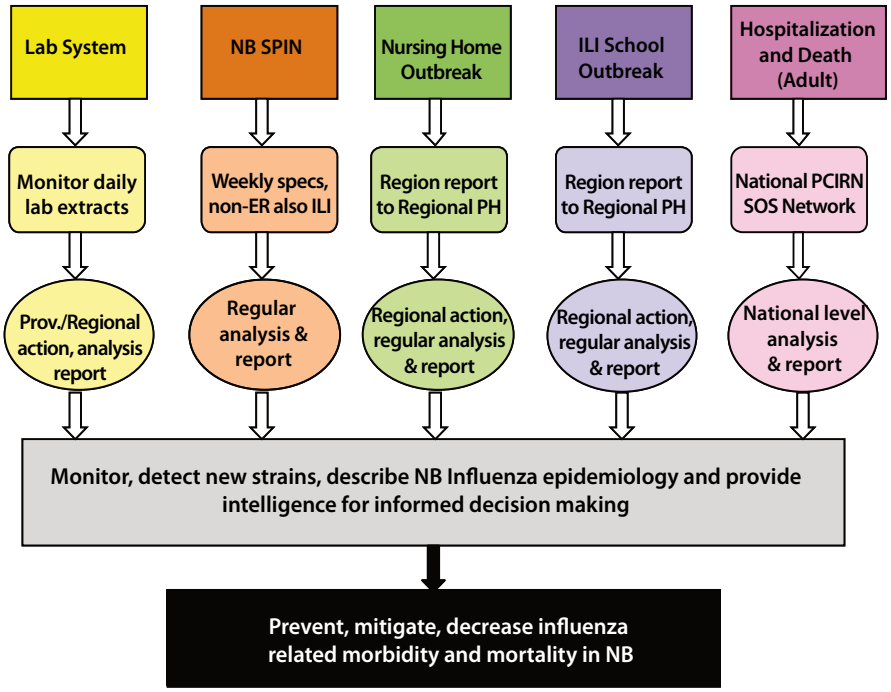
New Brunswick Sentinel Practitioners Influenza Network (NB SPIN)

Overview

The New Brunswick influenza surveillance system allows Public Health to monitor, detect and respond to provincial changes in influenza activity, morbidity, mortality and identify novel strains in a timely manner. It is a comprehensive system comprised of several components (see Figure 1). It is also linked with national and international surveillance and monitors several indicators of influenza spread and intensity: clinical illness, typing, antigenic characterization, resistance, outbreaks, and more severe cases of disease. This system is designed to be flexible and adaptable to changing epidemiology and/or Public Health program needs.

Figure 1:



A key contributor to influenza surveillance is the New Brunswick Sentinel Practitioner Influenza Network (NB SPIN). NB SPIN sites are composed of volunteer physicians, nurse practitioners and nurses that work in several health settings and geographical areas across the province.

This season the system includes 25 sites across all health regions in the province and includes eight emergency rooms, two walk-in clinics, three university clinics, one nursing home, three physician's offices, six community health centers and two practices in First Nation communities. This system enables the monitoring of two indicators: influenza-like-illness and laboratory testing results. One day per week, sites submit information on the number of patients with influenza-like-illness (ILI) out of the total number of patients seen that day. They also obtain laboratory specimens (preferably nasopharyngeal swabs) for patients with symptoms consistent with ILI. The laboratory results from surveillance specimen are complementary to clinical management laboratory samples as it allows for a more comprehensive coverage.

Recruitment

We are always looking for new sentinel sites. Additional sites would enhance the system by providing an even more complete picture of the situation in the province. All the necessary testing kits for laboratory specimens are provided to NB SPIN practitioners on a regular basis. If you're interested to learn more about the program, please contact the Communicable Disease Epidemiologist at 506-444-3044, or CDCUnit@gnb.ca or your Regional Medical Officer of Health.

Additional information:

Information on NB SPIN is available in the "Health Professionals" section of the Office of the Chief Medical Officer of Health website: http://www2.gnb.ca/content/gnb/en/departments/ocmoh/for_healthprofessionals/cdc.html

Emerging Respiratory diseases

Influenza A(H7N9)

Background

Influenza A(H7N9) is one subgroup of influenza viruses that normally circulate among birds. Sporadic cases of human infection with other H7 viruses have been reported; however, they were associated with outbreaks in poultry. The few A(H7) human infections that have occurred in the context of avian influenza outbreaks generally resulted in mild respiratory illness and conjunctivitis with the exception of one death.[1]

Until recently, H7N9 infection had not been documented in people, however on March 31, 2013 the first report of human infection was received by the World Health Organization (WHO) from the Health and Planning Commission of the People's Republic of China.

Epidemiology

As of Oct 16, 2013, the WHO has reported 136 laboratory-confirmed cases of human infection with avian influenza A (H7N9) virus, including 45 deaths. The case fatality rate is 30%.

Cases are from eight provinces (Anhui, Henan, Jiangsu, Zhejiang, Hunan, Fuijian, and Jiangxi) and two municipalities (Shanghai and Beijing;. In addition, a travel-related case was reported in Taiwan.[2]

Limited information on demographics is available. An epidemiologic study, in the New England Journal of Medicine, of 82 confirmed cases, indicates that the median age of patients was 63 years (range, 2 to 89); and two (2%) were in children younger than five years of age, both of whom had clinically mild upper respiratory illness.[1]

The number of cases detected after the month of April has fallen abruptly. The decrease in the number of new human H7N9 cases may have resulted from containment measures taken by Chinese authorities, including the closure of live bird markets, a change in seasons, or a combination of both. Studies indicate that avian influenza viruses have a seasonal pattern, thus new cases may appear when the weather turns cooler in China.

The animal reservoir of the H7N9 viruses and the mode of transmission that has occurred to infect humans in China remain uncertain at this time. Poultry in live bird markets is suspected to play a role, given the high percentage of cases reporting contact with poultry or live poultry markets, the identification of H7N9 virus from poultry and the environment at poultry markets, and the reduction in human cases that coincides with the closure of live poultry markets in Shanghai.[5]

Clinical Spectrum

Information on risk factors and clinical spectrum have been limited. Most cases developed respiratory symptoms consistent with influenza-like-illness followed by rapid progression to more severe disease after five to seven days including acute respiratory distress syndrome (ARDS), sepsis, shock, and multi-organ dysfunction syndrome and severe pneumonia.[6]

Common laboratory findings included normal white cell count, leukocytopenia, lymphocytopenia, thrombocytopenia, and mildly elevated liver enzymes. A few mild cases were reported, especially in children.[6]

Vaccine Development and Antiviral Susceptibility

Currently a vaccine for this subtype of the H7N9 influenza virus is not available. On September 26, 2013, the WHO made recommendations for H7N9 vaccine developments.[3] Earlier this month, the U.S. National Institutes of Health announced they have begun testing candidate vaccines for H7N9 in clinical trials, examining the potential role for adjuvants in improving the suboptimal immunogenicity of H7 candidate vaccines.[4] Laboratory testing has confirmed that the avian influenza A(H7N9) virus is susceptible to the neuraminidase inhibitors oseltamivir and zanamivir, two antiviral medications that are available in the National Antiviral Stockpile and National Emergency Stockpile System should they be needed to treat Canadians.[4]

Further research is required to understand the spectrum of disease, epidemiology, risk factors and virus-host interactions.

Risk Assessment

- The public health risk posed by avian influenza A(H7N9) virus from China to Canada is considered **low** at this time.
- There is no evidence of sustained human-to-human transmission of avian influenza A(H7N9) virus. However, limited human-to-human transmission has been reported between close contacts.
- There is no indication that international spread has occurred, although when infected people from affected areas travel, their infection may be detected in another country.[4]

Middle East Respiratory Virus (MERS CoV)

Background

This newly identified coronavirus strain was identified in September 2012 in individuals with severe acute respiratory illness (SARI) occurring in the Arabian Peninsula. Further investigations have identified infections as early as spring 2012, during a hospital outbreak of SARs. This coronavirus differs from the previously identified coronaviruses such as the SARS coronavirus (SARS-CoV), which caused the 2003 SARS outbreas. Both viruses are capable of causing severe disease. However, one of the key differences between the two is that MERS-CoV doesn't seem to get passed from person to person as easily as SARS virus did.

Epidemiology

As of October 18, 2013 139 laboratory confirmed cases of MERS-CoV have been reported in nine countries. Most patients are male (62%; 83 of 133 cases with sex reported) and range in age from two to 94 years (median 58 years, n=134). Sixty confirmed cases have died (case fatality rate 43%).[7]

To date, all cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. Twelve cases have been reported outside of the Middle East: United Kingdom (4), Italy (1), France (2), Germany (2) and Tunisia (3). These 12 cases resulted from six separate chains of transmission. The primary case for each chain had been infected in the Middle East and very limited local secondary transmission among close contacts was reported from the United Kingdom, France, and Tunisia. Twenty-four per cent of MERS-CoV infections have occurred from nosocomial transmission in healthcare settings, both in Europe and in the Middle East.[7]

Despite sporadic household and limited health care-associated clusters, there is currently no evidence of sustained human-to-human transmission in the community. The ratio of asymptomatic to symptomatic confirmed cases is increasing; most of these cases are amongst close contacts of identified cases. Eighteen asymptomatic cases were reported since June 2013, compared with no asymptomatic cases in the first five months of the year. An increase in mild/asymptomatic cases could signify reduced virulence with human passage or that other cases remain significantly undetected.[8]

New studies on the potential animal reservoirs of MERS-CoV are available, but the implications of these findings are still unclear. Phylogenetically, MERS-CoV most closely resembles bat-origin coronavirus identified in Hong Kong in 2006; however at this point the reservoir of MERS-CoV, the potential hosts, and the route of transmission of the virus remain unknown.[8]

Clinical Spectrum

MERS-CoV patients have primarily had respiratory disease. They typically present with influenza-like illness with signs and symptoms of pneumonia, which may include coughing, mucous, shortness of breath, malaise, chest pain and/or fever. Most patients present with(SAR) requiring hospitalization and eventually requiring mechanical ventilation or other advanced respiratory support. A number of secondary complications have also been reported, including acute renal failure, multi-organ failure,(ARD), and consumptive coagulopathy. In addition, many patients have also reported gastrointestinal symptoms, including diarrhea.[8]

The majority of patients have had at least one comorbid condition, but many have also been in previous good health. A small number of cases had co-infection with other viruses including influenza A, parainfluenza, herpes simplex, and pneumococcus. MERS-CoV infection may present atypically and initially without respiratory symptoms in immunocompromised individuals.[8]

Risk Assessment

- The risk to Canadians is deemed to be **low** at this time. This virus does not appear to spread easily from person to person
- No cases have been identified in Canada to date. While international spread is possible through travel, no cases of MERS-CoV have been reported outside of the Middle East since June 2013;
- Limited human-to-human transmission has occurred amongst very close contacts. In most clusters, however, the number of confirmed secondary cases remains low. No sustained human to human transmission has been documented to date;
- The WHO does not advise special screening at points of entry with regard to this event nor does it currently recommend the application of any travel or trade restrictions [7]

Surveillance and management of influenza A(H7N9)/MERS-CoV in New Brunswick

To enhance the early detection of the H7N9 or MERS-CoV viruses in New Brunswick and ensure timely and appropriate management of suspect or confirmed cases, clinicians are requested to do the following:

- Be vigilant for cases of SARs, which may include symptoms of fever, cough and clinical or radiological evidence of pulmonary parenchymal disease (e.g. pneumonia or(ARDS).
- If infectious diseases have not been ruled out, obtain information on travel occurring within 14 days prior to illness onset, or close contact with others who have travelled or have been affected by SARs. Note especially any travel to China or the Middle East.
- Implement appropriate infection control measures in your healthcare setting if a case is suspected or confirmed. Please refer to the latest guidance from Public Health Agency of Canada and your establishment's Infection Control Guidelines for acute respiratory illness.
- Obtain appropriate clinical specimens in consultation with infection control and your local laboratory (WHO strongly recommends lower respiratory specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage where possible and clinically indicated). Follow strict infection prevention and control guidelines when collecting respiratory specimens. Please submit all relevant clinical information with specimens, including information required to prioritize testing: travel to affected areas within 14 days prior to illness and exposure to animals, particularly birds or swine.
- As per the NB *Public Health Act* **all clinicians, including laboratories**, must report **all cases of suspected or lab-confirmed cases of MERS-CoV and H7N9 – noting details such as symptoms, animal contact, travel to China or Middle East within 14 days of onset-** to the Regional Medical Officer of Health. Reporting for suspected or lab-confirmed MERS-CoV must be done verbally within 24 hours followed in writing within seve7 days. Reporting for suspected or lab-confirmed H7N9 and other novel influenzas must be done verbally within one hour and followed in writing by end of next day. Also continue to **report clusters of respiratory illness** to the Regional Medical Officer of Health verbally within 24 hours followed in writing within 7 days.[9]
- Please advise patients travelling to China or Middle East to follow usual preventative measures against influenza, such as receiving the seasonal flu vaccine, hand hygiene and respiratory etiquette, avoiding contact with ill individuals and avoiding contact with live farm or wild animals.
- Remain up to date on relevant developments regarding H7N9 and MERS-CoV by visiting the Public Health Agency of Canada's website on these two viruses.

For the latest Canadian information on H7N9 and MERS-CoV including travel advisories and advice/guidance for the public and healthcare providers, please visit the Public Health Agency of Canada websites at:

H7N9: http://www.phac-aspc.gc.ca/eri-ire/h7n9/

MERS-CoV: http://www.phac-aspc.gc.ca/eri-ire/coronavirus/index-eng.php

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