01/11

New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction

Welcome to the first Disease Watch for 2011.

In this bulletin we update the epidemiology of Q fever, provide some advice on radon after a survey put New Brunswick at the top of affected provinces, update the current syphilis epidemic, remind practitioners that winter brings norovirus cases and provide links to changes in notifiable disease reporting. There is also a summary of the changes to immunization activity for 2011.

I wish to take this opportunity to thank Paul and Jan Van Buynder who have made a significant contribution to the Disease Watch team. I'm sure you will all join us in wishing them well in their next adventure on the West Coast.

Dr. Eilish Cleary

A case of Q Fever in New Brunswick and a change in epidemiology

In December a notification was received in the Fredericton area of Q fever in a serving military person. Q fever ("Q" for "query"), is a febrile illness caused by the bacteria Coxiella burnetti. The disease is found in every country except New Zealand and was first described in Australia in 1935.

Q fever is a zoonotic disease, most known for its transmission to humans from domestic livestock (particularly sheep, cattle and goats). The bacteria are shed in the urine, feces, and milk of infected animals. High concentrations of C. burnetii are also found in the placental products of infected animals and are released at high levels in the amniotic fluids and placenta during birthing, even though the animals themselves rarely show any symptoms of Q fever. The bacteria are very resistant to heat, desiccation (drying) and many disinfectants. Thus, the bacteria can persist for long periods of time in the environment. Transmission in humans usually occurs through inhalation of contaminated aerosols, such as barn dust, straw or wool, resulting in a largely occupational disease that mostly affects veterinarians and livestock workers and researchers.[1-3]

Although goats, sheep, and cattle are the primary carriers of the bacteria, camels and other livestock as well as ticks and rodents can harbor the disease. In rare cases it may be acquired by tick bites or by ingesting contaminated milk or dairy foods.

More recently, Q fever has been identified among US military troops returning from Iraq and Afghanistan suggesting an emerging at-risk occupational group. Hypothesized risk factors include exposure to contaminated dust, straw and animal products disturbed by the wind, vehicles, or helicopters during patrol, or inhabitation of shelters near infected animals, tick bites, and ingestion of unpasteurized milk.[4-6]

Although human-to-human transmission of Q fever is considered rare, sexual transmission from infected military personnel to partners has also been proposed.[7]

There is an ongoing outbreak of Q fever in The Netherlands. From January 1 through October 6, 2010, 482 human cases have been reported, including 7 deaths. Most of these cases have been in provinces in the southern part of the country, although cases have been reported throughout The Netherlands. These cases represent an outbreak of Q fever that has been ongoing in The Netherlands since 2007: 168 cases were reported in 2007, 1,000 cases in 2008, and 2,357 cases, including 6 deaths, in 2009.

C. burnetii is extremely infectious and very few organisms are required to cause infection. The incubation period varies depending on the infecting dose (i.e., a higher dose results in a shorter incubation period), but is typically 2-3 weeks.

According to the Centers for Disease Control and Prevention (CDC), the highly infectious and persistent nature of the bacteria makes its use as a biological warfare agent a concern.

Clinical Picture

Q fever can present as either acute or chronic disease and is extremely variable in terms of its severity and duration. Half of people acutely infected with Q fever do not show any signs of clinical illness; however, when present, symptoms resemble influenza-like illness including sudden onset of fever,

headache, chills, sweats, loss of appetite, fatigue and myalgia. Non-productive cough, sore throat, chest pain, nausea, vomiting, diarrhea, pneumonia (typically mild) and hepatitis may also occur.

Chronic Q fever is less common, but can develop months to years after an acute infection and may result in more serious complications such as endocarditis, pneumonia and chronic hepatitis. People who develop chronic Q fever often have pre-existing valvular heart disease or a history of vascular graft.[1-3]

Diagnosis

Because the signs and symptoms of Q fever are not specific to this disease, it is difficult to make an accurate diagnosis without appropriate laboratory testing. Results from some types of routine laboratory tests in the appropriate clinical and epidemiologic settings may suggest a diagnosis of Q fever. For example, a platelet count may be suggestive because persons with Q fever may show a transient thrombocytopaenia. Confirming a diagnosis of Q fever however requires serologic testing to detect the presence of antibodies to Coxiella burnetii antigens.

Coxiella burnetii exists in two antigenic phases called phase I and phase II. This antigenic difference is important in diagnosis. In acute cases of Q fever, the antibody level to phase II is usually higher than that to phase I, often by several orders of magnitude, and generally is first detected during the second week of illness. In chronic Q fever, the reverse situation is true. Antibodies to phase I antigens of C. burnetii generally require longer to appear and indicate continued exposure to the bacteria. Thus, high levels of antibody to phase I in later specimens in combination with constant or falling levels of phase II antibodies and other signs of inflammatory disease suggest chronic Q fever. Antibodies to phase I and II antigens have been known to persist for months or years after initial infection.

Improved accuracy in the diagnosis of Q fever can be achieved by looking at specific levels of classes of antibodies. IgM levels are helpful in the determination of a recent infection. In acute Q fever, patients will have IgG antibodies to phase II and IgM antibodies to phases I and II. Increased IgG and IgA antibodies to phase I are often indicative of Q fever endocarditis.

Serological diagnostic cut-offs vary between laboratories. Medical microbiology advice should be sought where doubt exists.

Treatment

Q fever is treatable with antibiotics, with doxycycline the treatment of choice. Antibiotics are most effective if they are started within the first three days of illness. Quinolone antibiotics are also beneficial. Chronic Q fever endocarditis is very difficult to treat and typically requires multiple medications over a period of years. A human vaccine for Q fever exists but is only available in Australia. Individuals who recover from infection likely possess lifelong immunity from re-infection.[1-2]

Prevention efforts include education of workers in high risk occupations about sources of infection, as well as ensuring appropriate handling and disposal of placental tissues and birth products at livestock facilities. Proper hygiene and disinfection processes are necessary after parturition, and pasteurization of dairy products is recommended to prevent possible transmission through contaminated milk.

Although Q fever is not a notifiable disease in Canada, C. burnetii does exist in Atlantic Canada.[8] Since 2005, five or less cases have been reported each year in New Brunswick; however, this figure may be under-reported due to the non-specificity of signs and symptoms. As with other jurisdictions, the main sources of infection in New Brunswick include close contacts with infected livestock and their by-products. The emerging significance of Q fever in active military personnel should also be recognized.

References:

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2 - Heymann, D. L. (2008). Control of communicable diseases manual (19th ed.). Washington, DC: American Public Health Association.

3 - Centers for Disease Control and Prevention. (2009). Q fever. Accessed on December 11, 2010 at www.cdc.gov/ncidod/dvrd/qfever.

4 - Anderson, A.D., Baker, T.R., Littrell, A.C., Mott, R.L., Niebuhr, D.W. & Smoak, B.L. (2010). Seroepidemiologic survey for Coxiella burnetii among hospitalized US troops deployed to Iraq. Zoonoses Public Health [epub ahead of print].

5 - Aronson, N.E., Sanders, J.W., & Moran, K.A. (2006). In harm's way: infections in deployed American military forces. CID, 43:1045-1051.

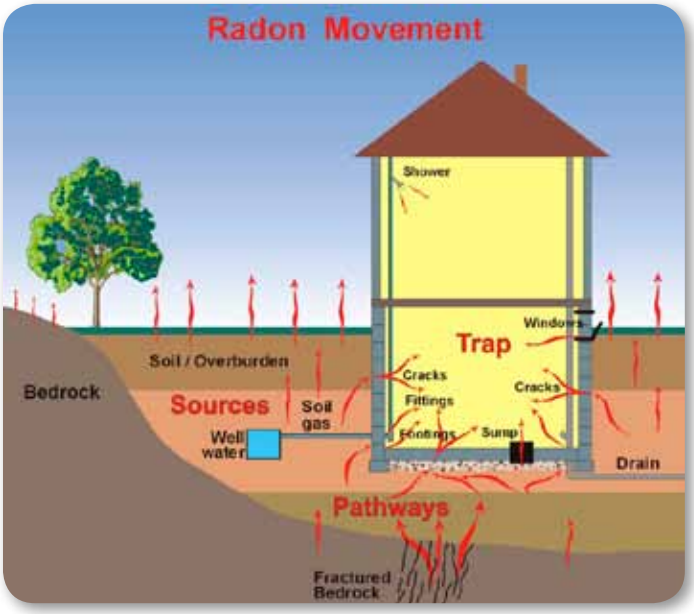
6 - Faix, D.J., Harrison, D.J., Riddle, M.S., Vaughn, A.F., Yingst, S.L., Earhart, K. et al. (2008). Outbreak of Q fever among US military in Western Iraq, June-July 2005. CID, 46:e65-e68.

7 - Miceli, M.H., Veryser, A.K., Anderson, A.D., Hofinger, D., Lee, S.A. & Tancik, C. (2010). A case of person-to-person transmission of Q fever from an active duty serviceman to his spouse. Vector-borne and zoonotic diseases, 10(5):539-541.

8 - Marrie, T.J., Campbell, N., McNeil, S.A., Webster, D. & Hatchette, T.F. (2008). Q fever update, Maritime Canada. Emerging Infectious Diseases, 14(1):67-69.

- Q fever is a zoonosis producing a febrile illness occurring occasionally in New Brunswick.
- It should be particularly considered in those working with livestock, travellers who have visited the Netherlands and deployed or recently redeployed soldiers who have an illness with fever, especially if they also have pneumonia or hepatitis.
- Diagnostic testing is complex and advice should be sought from local medical microbiology staff.

Radon - the New Brunswick story



In June 2007, Health Canada announced a lowering of the Canadian guideline for indoor exposure to radon. The new guideline of 200 Becquerel per cubic meter (Bq/m3) was reduced from 800 Bq/m3. (*A Becquerel means one radioactive disintegration per second*) The reduction was the result of new information indicating the health risk of radon-induced lung cancer occurs at lower levels of exposure than previously thought. The previous guideline was primarily based on data from uranium miners.

Health Canada recently completed the analysis of data from the first year of a two year Cross-Canada Survey of Radon Concentrations in Homes. The survey gathered long-term (three month or longer) indoor radon measurement results from across Canada from approx 9000 randomly selected homes across all provinces and territories during the 2009/2010 fall and winter heating season. These results are shown below.

Radon Results by Province and Territory (Bq/m3)

Province/Territory	Below 200 BBq/	200 to 600 Bq/m^3	Above 600
AB	93.1%	6.5%	0.4%
BC	95.4%	3.9%	0.7%
MB	76.5%	22.1%	1.4%
NB	**83.0%**	**11.7%**	**5.3%**
NL	94.7%	4.4%	0.9%
NS	91.8%	6.3%	1.9%
NT	96.0%	4.0%	0.0%
NU	100.0%	0.0%	0.0%
ON	95.1%	4.3%	0.6%
PE	95.5%	4.5%	0.0%
QC	91.0%	8.3%	0.7%
SK	84.2%	14.2%	1.6%
YT	84.1%	10.6%	5.3%

The radon results for NB indicate that 17% of homes tested had results greater than the Health Canada Guideline and 5.3% (equal highest in Canada) had levels more than three times the new guideline. These values are as expected since uranium is known to be present in significant levels throughout NB geologic formations.

What is radon?

Radon is a colorless, odorless, radioactive gas that occurs in the environment resulting from the natural breakdown of uranium in soils and rocks. When radon is released from the ground into the outdoor air it is diluted and is not a concern. However, radon can accumulate in enclosed spaces such as homes to levels that are considered to be a health hazard. Exposure to elevated levels of radon has been associated with an increased risk of lung cancer, depending 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. Exposure to radon and tobacco use together can significantly increase the risk of lung cancer. 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 of a non-smoker exposed to the same high radon level is one in twenty.

Other than lung cancer, there is no evidence that radon exposure causes other harmful health effects, such as other cancers, respiratory diseases such as asthma, or symptoms such as persistent coughing or headaches. There are no conclusive data on whether children are at greater risk than adults from radon.

How can I check my home for radon?

Radon enters a building because the air pressure inside a building is generally lower than in the soil surrounding the foundation. Radon and other gases are then drawn from the soil into a building. 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 a variety of laboratories and some home improvement retailers. They are also available over the internet. Health Canada recommends testing for a minimum of 3 months during the heating months between October and April. The most popular long term radon detectors are the electret ion chamber and the alpha track detector. These devices are exposed to the air in a home or building for a specified period of time, and then sent to a laboratory for analysis.

How can homeowners minimize the risk of radon?

If they are a smoker they should quit smoking.

They should have their home tested.

If their radon level is above the recommended guideline they should reduce the level using methods they find affordable and practical. Levels can be reduced by:

- Increasing the mechanical ventilation, via a heat recovery ventilator (HRV), to allow an exchange of air;
- Sealing all cracks and openings in foundation walls and floors, and around pipes and drains;
- Painting basement floors and foundation walls with two coats of paint and a sealant.
- Ventilating the basement sub-flooring by installing a small pump to draw the radon from below the concrete slab to the outside.
- Active Soil Depressurisation (ASD); this method is typically performed by a contractor. Professional contractors recognized by Health Canada can be hired for both testing and mitigation.

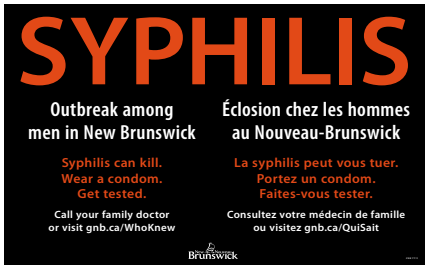
For more information, visit the GNB website www.gnb.ca/health or the Health Canada Web site www.healthcanada.

gc.ca/radon or call 1 800 O-Canada (1 800 622-6232), TTY - 1 800 926-9105 for more information on radon and testing your home.

UPDATE: Syphilis outbreak in New Brunswick

The province of New Brunswick is experiencing an outbreak of infectious syphilis (primary, secondary, and early latent). In 2010, a total of 38 cases were reported to Public Health corresponding to an incidence rate of 5.1 per 100,000 population. This represents a nine-fold increase compared to 2007. The largest number of cases has been reported in the Moncton area; however, more recently, an increased number of cases have been observed in the Fredericton region. Additional cases have also been reported in Saint John and Northern New Brunswick.

The majority of cases are male, among whom at least half are men who have sex with men (MSM). There have been a small number of cases among women, two of whom were pregnant. Most cases occurred in individuals aged 20-34 and 40-44 years. Many individuals diagnosed with infectious syphilis reported multiple sexual contacts.

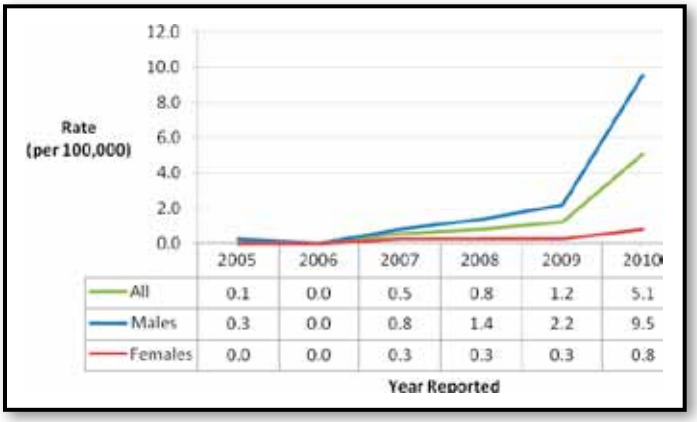


A particularly worrisome aspect of the outbreak is that several of the cases are co-infected with HIV. Syphilis in HIV-positive patients is more difficult to treat and the co-infection implies a risk of significant HIV transmission with this outbreak.

A provincial outbreak control team has been formed and enhanced surveillance and control measures are currently being implemented.

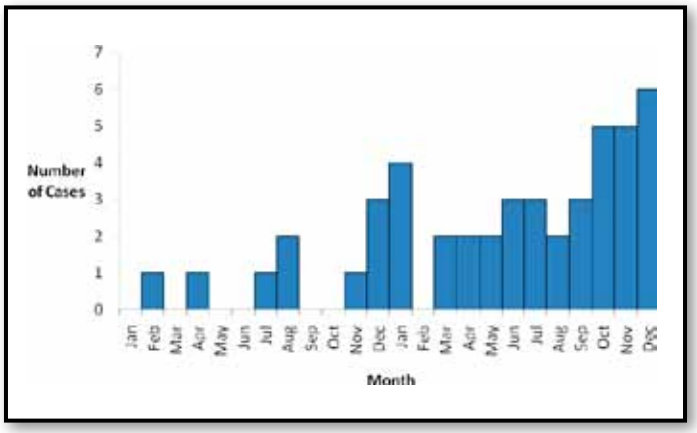
A letter was distributed to clinicians at the end of December 2010 to increase diagnostic alert for syphilis, encourage consultation with infectious disease specialists, and urge the submission of appropriate samples to laboratories for testing. Clinicians are also asked to test all possible syphilis cases for HIV and other STIs, institute appropriate therapy, and refer patients to Public Health for contact tracing and follow-up with an enhanced surveillance questionnaire. Practitioners are reminded that all pregnant women should be tested for syphilis at the first antenatal visit.

Figure 1. Annual incidence rates of infectious syphilis by sex, New Brunswick, 2005-2010 (N=58)



	2005	2006	2007	2008	2009	2010
All	0.1	0.0	0.5	0.8	1.2	5.1
Males	0.3	0.0	0.8	1.4	2.2	9.5
Females	0.0	0.0	0.3	0.3	0.3	0.8

Figure 2. Cases of infectious syphilis by reporting month and year, New Brunswick, January 1, 2009 – December 31, 2010 (N=46*)



*** Reporting date is missing for one case in 2010.**

Winter vomiting disease arrives in New Brunswick

The New Brunswick CDC unit has been advised of a number of norovirus outbreaks in long term care facilities and hospitals in recent weeks. Noroviruses are small round structured viruses in the family *Caliciviridae*. The term norovirus was approved as the official name for this group of viruses in 2002. Previously, they were called Norwalk-like viruses, as norovirus was first identified as a virus in 1972 after an outbreak in Norwalk, Ohio.

Noroviruses are a common cause of acute gastroenteritis outbreaks in healthcare and long-term care facilities, schools and daycares and on cruise ships accounting for about 80% of all such outbreaks. Noroviruses outbreaks occur throughout the year but are more common in winter months and affect all age groups. There is no vaccine that will prevent a norovirus infection.

Noroviruses are found in the stool or vomit of infected people. They are very contagious and can spread easily from person to person. People exposed to the virus usually develop symptoms of illness within 24 to 48 hours, but symptoms can occur as early as 12 hours after exposure. People infected with norovirus can be contagious from the moment they start feeling ill to at least three days after they have recovered. Some people may be contagious for as long as two weeks after recovery.

People can become infected with the virus in several ways, including: through direct contact with another person who is infected (e.g. caring for or diapering an ill child, sharing food or eating utensils with an ill person), by touching surfaces or objects contaminated with norovirus (like door handles) or by eating food or drinking water that has been contaminated.

The virus is able to survive relatively high levels of chlorine and varying temperatures. Noroviruses can survive on practically any surface including door handles, sinks, railings and glassware. On hard surfaces in the environment, they have been found to survive for up to 12 hours. On contaminated carpet, noroviruses have been found to survive for up to 12 days.

The symptoms of norovirus illness include nausea, vomiting, diarrhea and stomach cramps. Sometimes, people may have a low-grade fever, chills, headache, muscle aches and fatigue. The illness often begins suddenly, about 24 to 48 hours after exposure and the infected person may become very sick with frequent vomiting and/or diarrhea. In general, children experience more vomiting than adults. In most

healthy people, acute diarrhea and vomiting usually last eight to twelve hours and people normally recover in 48 hours. Symptoms may last longer in some people.

Management in Long Term Care Facilities

Prevention of outbreaks in institutions depends on good food handling practices, and compliance with hand washing on the part of staff. Staff with symptoms of nausea, diarrhea or vomiting must be excluded from work, and should not return to work until 48 hours after these symptoms subside. Hospitals and nursing homes should also maintain surveillance for clusters of gastroenteritis, so that more stringent precautions may be taken if there is evidence of transmission within the facility.

Healthcare professionals who take care of patients with symptoms of noroviruses should wear a gown and gloves. Special attention to hand washing (with soap) must be practiced by everyone. Patient movement should be minimized and reductions placed on visiting to the institutions.

Further information is available at http://www.phac-aspc.gc.ca/id-mi/norovirus-eng.php

Immunization - 2010 a year in review and looking forward

The 2010 year was an exciting one for immunization in New Brunswick. New vaccines, improved protection from existing ones, expanded eligibility criteria for publicly funded vaccines and pharmacists delivering immunizations.

Seasonal Influenza Immunization Program Changes

New Brunswick expanded publicly funded influenza vaccine in 2010/11 to include children aged two to 18 years and all household contacts of children aged six months to five years. The seasonal influenza marketing campaign this year targeted key groups including children, pregnant women and health-care workers. Around 250,000 doses of publicly funded influenza vaccine have been provided to people at high risk of complications from seasonal flu, 15% more than in 2009 which was also a record year.

The New Brunswick influenza season has just commenced with 20 cases in the first two weeks of January, almost all being the H3N2 influenza A strain that we expect to predominate this year. With high H1N1 vaccine coverage in 2009 and probably some ongoing protection from a highly effective adjuvanted vaccine, plus good seasonal flu vaccine coverage in 2010/11, we hope that this year's flu season will be a mild one.

Improved pneumococcal conjugate vaccine protects children against an extra six serotypes

The 13 valent pneumococcal vaccine, Prevnar 13 replaced Prevnar 7 on July 1st 2010. Prevnar 7 protected against serotypes 4, 6B, 9V, 14, 18C, 19F, 23F. The improved vaccine provides protection against an extra six serotypes 1, 3, 5, 6A, 7F and 19A., Serotypes 19A, 6A and 3 have emerged as the predominant pneumococcal serotypes causing Invasive Pneumococcal Disease (IPD) in children, accounting for approximately 40 cases of IPD in New Brunswick in 2008-9. Additionally serotype19A is increasingly likely to be resistant to commonly used first-line antibiotics.

Pertussis 'Cocooning' vaccine campaign

Due to a pertussis epidemic in Northern California and increasing cases and infant deaths in other Canadian provinces, New Brunswick introduced a 'cocooning' strategy for newborns and infants who are not fully protected against pertussis disease. From January 1st, 2011, all mothers who give birth are eligible to receive the Tdap vaccine in the hospital post delivery to 'cocoon' their baby against pertussis. New and expecting fathers/partners and adopting parents can also receive the Tdap vaccine for free from their local Public Health office. Although not publicly funded as yet, the Health Department is recommending that all close contacts of newborns also get the vaccine so that babies and young infants are protected. Health-care workers in acute-care settings who care for infants less than 12 months are advised to receive the Tdap vaccine.

Two dose Varicella vaccine

On January 1st 2011, a two dose varicella immunization program was introduced for children at age 12 months and 18 months. Previously children received one varicella vaccine at 12 months of age, however studies have shown that one dose does not provide adequate long term protection and a two dose schedule would reduce the incidence of breakthrough disease and Zoster.

MMRV vaccine

A combination measles-mumps-rubella-varicella (MMRV) vaccine, Priorix-Tetra™, GlaxoSmithKline (GSK) Inc., has been authorized for use in Canada. The MMRV vaccine will be introduced onto the routine immunization schedule later in 2011 to replace the MMR and Varicella vaccine currently given at 12 and 18 months.

Increasing access to immunization in New Brunswick

Additional partners now assist in providing vaccine for New Brunswick people. Since 2010, there have been over 145 NB pharmacists who have undertaken an accredited immunization course. The course provided by the Dalhousie University in Nova Scotia and including education sessions from NB public health nurses with expertise in immunization, has been very successful. During 2010/11 pharmacists throughout the province have been providing publicly funded influenza vaccine to high risk people in New Brunswick.

Some pharmacists also administer vaccines that are not publicly funded, for example Zoster vaccine and HPV vaccines and many are assisting with the pertussis booster campaign.

The New Brunswick Safe Sex campaign started in theatres and via social marketing sites on January 28th. In a response to the ever-increasing number of Chlamydia cases in youth (over 1800 in 2010) the campaign is sending messages about the risk involved, the need for testing and the need to take precautions.