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Severe Acute Respiratory Syndrome (SARS) Surveillance and Prevention Update

Background

Severe Acute Respiratory Syndrome (SARS) is a newly recognized, severe febrile respiratory illness caused by the SARS-associated coronavirus (SARS-CoV). SARS emerged in the southern Chinese province of Guangdong in November 2002. It went on to cause a worldwide epidemic in late February 2003 when an ill physician from Guangdong infected guests at a Hong Kong hotel. These persons became the index patients for large outbreaks of SARS in Hong Kong, Vietnam, Singapore, and Canada.

In the US, only 8 confirmed cases of SARS occurred, one of whom was a Virginia resident. However, the potential for wider transmission led the Council of State and Territorial Epidemiologists (CSTE) to add respiratory illness due to SARS-CoV to the list of nationally reportable diseases. As a result, VDH added SARS to the reportable disease list in Virginia.

Although the SARS outbreak was considered contained by July 2003, potential sources of re-emergence continue to exist. These include animal reservoirs, humans with persistent infection, unrecognized transmission in humans, or laboratory exposure. Undetected SARS cases efficiently spread SARS-CoV, and the illness can generate substantial health, social, and economic consequences. In the absence of a vaccine or effective drugs, rapid case and contact identification are required to limit the impact of SARS. Therefore, continued surveillance is required for early recognition of new outbreaks.

SARS Preparedness: Key Messages

1. **Early case detection prevents disease spread**
2. **Risk of exposure to SARS is key to determining the likelihood of diagnosis**
3. **Rapid contact tracing contains disease**
4. **Judicious use of SARS-CoV testing is important**
5. **Collaboration between health care providers and public health agencies insures SARS preparedness**

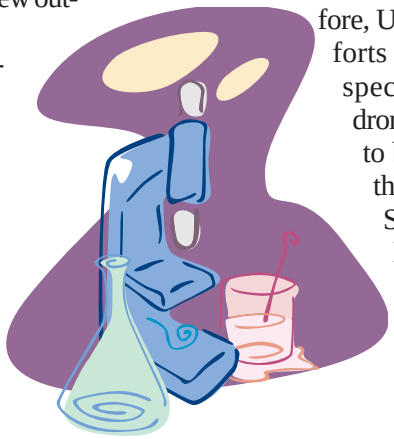
One challenge for surveillance is that the clinical features of SARS are nonspecific. In addition, although laboratory tests are both sensitive and specific, they do not reliably detect SARS-CoV <u>early</u> in the illness.

Therefore, assessing the risk of exposure is KEY to the likelihood of SARS diagnosis. The tendency for SARS-CoV transmission to occur among international travelers and in healthcare settings, and to cause unusual clusters of pneumonia provides a focus for surveillance in the absence of known SARS activity (i.e., patients hospitalized for pneumonia, pneumonia in healthcare workers, unusual clusters of pneumonia among travelers). If SARS reappears, then patients or known sites of SARS-CoV transmission become the most likely source of exposure.

Identification of Possible SARS Cases When No Known SARS Activity

1st Line of Defense: Astute Clinician

Currently, no known source of SARS transmission exists. Therefore, U.S. surveillance efforts need to focus on specific clinical syndromes in groups likely to be first affected by the re-emergence of SARS. The most likely sites of SARS-CoV recurrence are: 1) locations where SARS-CoV transmission previously oc-



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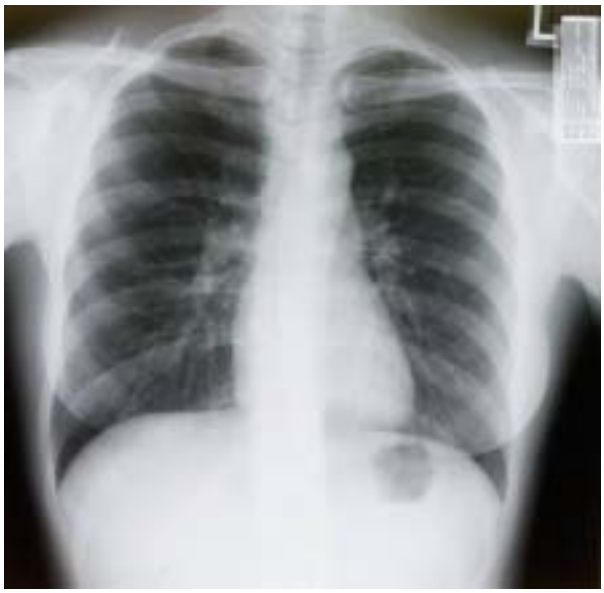


curred, 2) the original site of introduction of SARS-CoV from animals to humans, 3) large international travel hubs serving as nodes to high-risk locations, and 4) laboratories in which a break in technique leads to laboratory-acquired infections.

Therefore, current recommendations are to ask patients hospitalized with pneumonia:

1. **"In the last 10 days, have you traveled to mainland China, Hong Kong or Taiwan*, or been in close contact with other ill persons who have?"**
2. **"Are you employed as a healthcare worker with direct patient contact?"**
3. **"Do you have close contacts** who have been told they have pneumonia?"**

If a patient hospitalized for pneumonia answers "yes" to at least one of the three screening questions, providers should:

- Notify their local health department;
- Consider SARS testing, but only if no alternative diagnosis is found in 72 hours.

In addition, providers should be suspicious of clusters of unexplained pneumonia among two or more healthcare workers from the same facility. This occurrence should be reported to the local health department.

To facilitate identification of patients who may have SARS in ambulatory care settings, targeted screening questions concerning fever, respiratory symptoms, close contact with a suspected SARS patient, and recent travel should be included **when patients call for appointments and at triage, or as soon as possible after patient arrival**. Health-care personnel who are the first points of contact should be trained to perform SARS screening.

Identification of Possible SARS Cases If SARS Re-Emerges

In the presence of SARS activity, the probability that a respiratory illness is SARS increases. Providers should then consider SARS in patients with early or mild respiratory illness and who have SARS risk factors.

Surveillance efforts should be modified to incorporate available risk factor information, particularly regarding geographic transmission patterns. Screen all patients hospitalized for pneumonia OR presenting to facilities with fever or clinical findings of lower respiratory infection (cough, shortness of breath, difficulty breathing) for SARS risk factors (travel history within 10 days to a location with documented or suspected activity, close contact within 10 days of illness onset with person with known or suspected SARS infection, or health care workers).

If a patient has fever/respiratory symptoms and SARS risk factors, begin SARS isolation precautions, and notify the local health department immediately.

SARS Testing

Testing of suspected SARS patients should include chest radiograph, pulse oximetry, blood cultures, sputum Gram's stain and culture, and testing for viral respiratory pathogens (influenza A and B, and respiratory syncytial virus). A specimen for *Legionella* and pneumococcal urinary antigen testing should also be considered. Clinicians should save any available clinical specimens (respiratory, blood, and serum) for additional testing until a specific diagnosis is made. Acute and convalescent (greater than 28 days after onset of symptoms) serum samples should be collected from each patient who meets the SARS case definition.

In the absence of SARS activity, the positive predictive value of a positive laboratory test is extremely low and false-positive tests will raise concerns unnecessarily. Therefore, SARS-CoV antibody testing (enzyme immunoassay (EIA) or indirect fluorescent-antibody (IFA)), reverse transcription-polymerase chain reaction (RT-PCR) testing, and viral isolation should only be considered in consultation with local or state public health officials.

Respiratory Etiquette to Reduce SARS Transmission

The respiratory etiquette strategy that CDC has recommended for any patient presenting with **respiratory symptoms** includes:

- provide surgical masks for patients and staff evaluating patients;
- emphasize frequent hand hygiene to staff and patients;
- designate a separate waiting area and move patients to a private room or cubicle as soon as possible;
- consider plexiglass barriers at triage to protect staff from contact with respiratory droplets; and,
- use droplet precautions until it is determined that the cause of symptoms is not an infectious agent that requires more than standard precautions.

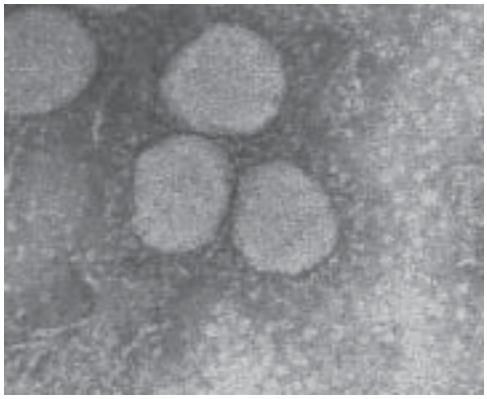
For patients who have either fever or respiratory symptoms AND have had close contact with SARS or who have a history of international travel to an area

**Mainland China is likely the origin of 2002/2003 outbreak. Although it is less likely, SARS may re-emerge from Hanoi, Singapore or Toronto. If providers suspect SARS in recent travelers to Hanoi, Singapore, or Toronto, notify the local health department. The most recent case definition for SARS should be used as the basis for questions regarding travel history (see http://www.cdc.gov/ncidod/sars/).*
***Close contact is caring for or living with a person, or having a high likelihood of direct contact with respiratory secretions and/or body fluids. Close contact includes kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief period of time.*

identified in the case definition, a surgical mask should be placed on such patients early during the triage process until the following recommended infection control precautions can be instituted:

- Standard precautions (e.g., hand hygiene), including eye protection;
- Contact precautions (e.g., gown and gloves for contact with the patient);
- Airborne precautions (e.g., an isolation room with negative pressure and use of an N-95 filtering disposable respirator). Where respirators are not available, healthcare personnel evaluating and caring for suspect SARS patients should wear a surgical mask.

Decisions concerning inpatient hospital admission or discharge of a patient with suspected or developing SARS should generally be based on the patient's healthcare needs (e.g., diagnostic, therapeutic, or supportive regimens that necessitate hospitalization). Patients should not be hospitalized solely for the purpose of infection control unless they cannot be discharged directly to their home (e.g., travelers, homeless persons) and a suitable facility for isolation cannot be identified. During transport between the health-care facility and home, patients should wear a surgical mask and limit interactions with others (e.g., avoid public transportation).



SARS-associated coronavirus

Role of State and Local Public Health

Frequent communication and data sharing among public health officials and healthcare providers are necessary to update the status of potential and diagnosed SARS cases. The role of the local and state health departments in Virginia in the control of SARS includes:

- Establish a surveillance system to receive reports of:
  - → Persons who are hospitalized for pneumonia and have SARS risk factors,
  - → Clusters of persons (especially healthcare workers) with unexplained pneumonia, and
  - → Positive SARS-CoV test results;
- Review individual reports from providers to further assess the likelihood that an illness might be due to SARS-CoV infection. If no alternate diagnosis is established, and the clinician and health department have a high index of suspicion for SARS, testing for SARS-CoV will be considered. Your local health department will help coordinate specimen submission to the state laboratory;
- Investigate pneumonia clusters;
- Disseminate surveillance guidelines regarding timely recognition, evaluation, and reporting of possible SARS infections to healthcare providers;
- Consult with the CDC as needed regarding cases or clusters of special concern, and report potential SARS cases to the CDC;
- Conduct contact tracing (the identification and evaluation of people with potential SARS exposure). Contact tracing enables early recognition of illness in persons at greatest risk, and helps to prevent the spread of disease by monitoring for evidence of infection and the need for isolation.
- Advise patient and household members regarding precautions necessary to prevent spread of SARS.

Summary

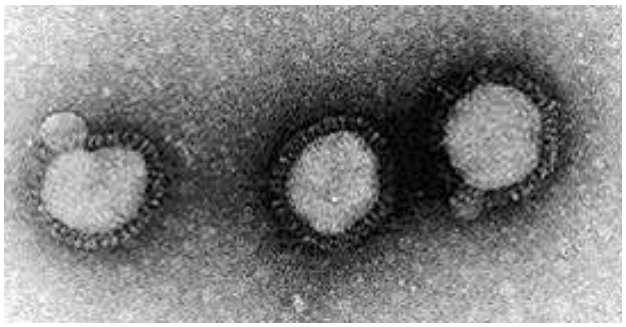
Severe Acute Respiratory Syndrome (SARS) is a highly contagious, life-threatening lower respiratory tract infection. While currently dormant, SARS may re-emerge at any time. Preparation, including provider vigilance and an integrated surveillance system, will help to rapidly identify and contain future outbreaks. Collaboration between health care providers and public health agencies at all levels is critical to making this work.

Additional information about the SARS pandemic is available on the **World Health Organization's (WHO) SARS Web site** (http://www.who.int/csr/sars/en/) and the **Centers for Disease Control and Prevention's (CDC) SARS Web site** (**http://www.cdc.gov/ncidod/sars/**). The current draft of the CDC's SARS preparedness plans are also available (http://www.cdc.gov/ncidod/sars/sarsprepplan.htm)**.**

Intranasal InfluenzaVaccine

Addendum to 2003 Influenza Recommendations

These recommendations are adapted from the Supplemental Recommendations of the Advisory Committee on Immunizations Practices. The full text can be viewed on the Centers for Disease Control and Prevention website (http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5213a1.htm).



Influenza viruses

Flu season is here, and some patients may now have one less excuse (i.e., fear of needles) for avoiding their influenza vaccination: an intranasally administered, cold-adapted, live, attenuated influenza vaccine (LAIV) (FluMist®, by MedImmune, Inc) has been licensed for use in the US.

The 'traditional' injectable inactivated influenza vaccine and LAIV both:

- Contain antigenically equivalent strains of influenza viruses;
- Use viruses grown in eggs;
- Require annual administration to provide optimal protection against influenza infection;
- Provide high levels of protection from influenza; and,
- Have very low rates of adverse reactions.

Potential advantages of LAIV include induction of a broad mucosal and systemic immune response, ease of administration, and the acceptability of an intranasal rather than an intramuscular route of administration. However, important differences between the inactivated influenza vaccine and LAIV include:

1) The injectable inactivated influenza vaccine only needs to be kept refrigerated. In contrast, LAIV must be stored at -15°C or colder, and should not be stored in a frost-free freezer, unless a manufacturer-supplied freezer box is used.
2) The extra expense: acquisition costs for the injectable inactivated influenza vaccine are $7 - $10/dose. For FluMist®, costs are about $46/dose.
3) Most importantly, the injectable inactivated influenza vaccine induces an immune response WITHOUT causing infection. However, LAIV contains live viruses capable of replication. Therefore, LAIV is restricted to use **only** for healthy persons aged 5-49 years. Vaccination with LAIV is **NOT RECOMMENDED** in:
   - persons aged <5 years;
   - persons aged ≥50 years;
   - persons with asthma, reactive airways disease or other chronic disorders of the pulmonary or cardiovascular systems;
   - persons with other underlying medical conditions, including metabolic diseases such as diabetes, renal dysfunction, and hemoglobinopathies;
   - persons with known or suspected immunodeficiency diseases or who are receiving immunosuppressive therapies;
   - children or adolescents receiving aspirin or other salicylates (due to an association between Reye syndrome and wild-type influenza infection); or
   - pregnant women.

Since these patients benefit considerably from protection from influenza, they need to receive the injectable inactivated influenza vaccine. In addition, although the risk for transmission of LAIV from vaccine recipients to immunosuppressed contacts is unknown, use of **inactivated influenza vaccine** is preferred for vaccinating household members, health-care workers, and others who have close contact with immunosuppressed persons. Either inactivated influenza vaccine or LAIV can be used to vaccinate healthy persons aged 5-49 years in close contact with other groups at high risk for influenza.

Persons with a history of hypersensitivity, including anaphylaxis, to any of the components of LAIV or inactivated influenza vaccine, or to eggs, should not receive either LAIV or inactivated influenza vaccine. In addition, a past history of Guillain-Barré syndrome is a contraindication for LAIV. Persons with a past history of Guillain-Barré **and** at high risk from the complications of influenza should be evaluated prior to receiving the inactivated injectable influenza vaccine.

FluMist® Dosage and Administration

- LAIV is intended for intranasal administration only—**do not** administer by the intramuscular, intradermal, or intravenous route.
- Thaw prior to administration (hold an individual sprayer in the palm of the hand until thawed, with subsequent immediate administration). The vaccine can also be thawed in a refrigerator and stored at 2-8°C for ≤24 hours before use. However, LAIV vaccine should not be refrozen after thawing.
- LAIV is supplied in a pre-filled single-use sprayer containing 0.5 ml of vaccine (1 dose).
  - → 0.25 ml (i.e., half of the total sprayer contents) is sprayed into the first nostril while the recipient is in the upright position.
  - → An attached dose-divider clip is removed from the sprayer

to administer the second half of the dose into the other nostril. If the vaccine recipient sneezes after administration, the dose should not be repeated.

LAIV should be administered **annually** according to the following schedule:

- Children aged 5-8 years previously unvaccinated at any time with either LAIV or inactivated influenza vaccine should receive 2 doses (0.5 ml/dose) of LAIV separated by 6-10 weeks.
- Children aged 5-8 years previously vaccinated at any time with either LAIV or inactivated influenza vaccine should receive 1 dose of LAIV. They do not require a second dose.
- Persons aged 9-49 years should receive 1 dose of LAIV.

LAIV can be administered to persons with minor acute illnesses (e.g., diarrhea or mild upper respiratory tract infection with or without fever). If clinical judgment indicates nasal congestion that might reduce delivery of the vaccine to the nasopharyngeal mucosa, consider use of the inactivated vaccine, or defer administration of LAIV until resolution of the illness.

Whether concurrent administration of LAIV with other vaccines affects the safety or efficacy of either LAIV or the simultaneously administered vaccine is unknown. Inactivated vaccines do not interfere with the immune response to other inactivated vaccines or to live vaccines. An inactivated vaccine can be administered either simultaneously or at any time before or after LAIV. Two live vaccines not administered on the same day should be administered ≥4 weeks apart when possible.

The effect on safety and efficacy of LAIV coadministration with influenza antiviral medications (including amantadine for Parkinson's disease), has not been studied. However, because influenza antivirals reduce replication of influenza viruses, LAIV should not be administered until 48 hours after cessation of influenza antiviral therapy, and influenza antiviral medications should not be administered for 2 weeks after receipt of LAIV.

Side Effects

The viruses in the inactivated injectable influenza vaccine are killed, so **you cannot get influenza from the injectable inactivated vaccine**. The most common side effects from inactivated vaccine are soreness and redness at the injection site, lasting 1-2 days. The viruses in LAIV are live, and may cause a very mild upper-respiratory tract infection—the most common side effects from LAIV are runny nose and nasal congestion.

Summary

The importance of vaccinating EVERY eligible patient against influenza cannot be overemphasized. Remember that vaccination in December, or even later, can still prevent the flu. January and February are typically peak flu months in Virginia, but increased flu activity can last into March.

LAIV provides an alternative tool for influenza vaccination for some patients. However, LAIV's more complicated storage requirements, higher cost, and restriction to only healthy patients between 5-49 years of age may limit its utility. As a result, the injectable inactivated influenza vaccine remains a primary disease prevention tool.

For more information, contact the Virginia Department of Health Division of Immunization at (804) 786-6246 or visit the VDH Web site (www.vdh.state.va.us).

Flu Facts

Each year about 114,000 people in the U.S. are hospitalized and about 36,000 people die because of the flu. Most who die are 65 years and older. But small children less than 2 years old are as likely as those over 65 to have to go to the hospital because of the flu.

Got CME?

Foodborne illnesses have a major public health impact in the United States. It is estimated that each year in the United States, 76 million people get sick, more than 300,000 are hospitalized, and 5,000 die as a result of foodborne illnesses.

As a result, the AMA and CDC are offering three (free) credit hours for Category I CME through the "Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians." The purpose is to provide health professionals with current and accurate information for the diagnosis, treatment and reporting of foodborne illnesses. The primer also provides health care professionals with patient education materials on the prevention of foodborne illness.

Go to http://www.ama-assn.org/ama/pub/category/3629.html for more information.

Respiratory Illness Prevention Posters for Your Office

New!!!
From the Virginia Department of Health: Respiratory Illness Etiquette Poster
At: http://www.vdh.state.va.us/

Also, great Flu posters are available at: CDC National Immunization Program (NIP)
http://www.cdc.gov/nip/flu/gallery.htm#poster
(Also available in Spanish)

Flu Corner
Influenza in Virginia — Update

Outbreaks of laboratory confirmed cases of influenza A have been detected in Virginia. This is significantly earlier than recent seasons, and as a result the Virginia Department of Health (VDH) has issued statewide health advisories.

National surveillance has indicated that influenza A (H3N2) is the predominant strain circulating this season. While strain drift from the current vaccine has been identified, the vaccine is expected to provide some degree of effectiveness, although the level of protection cannot be predicted.

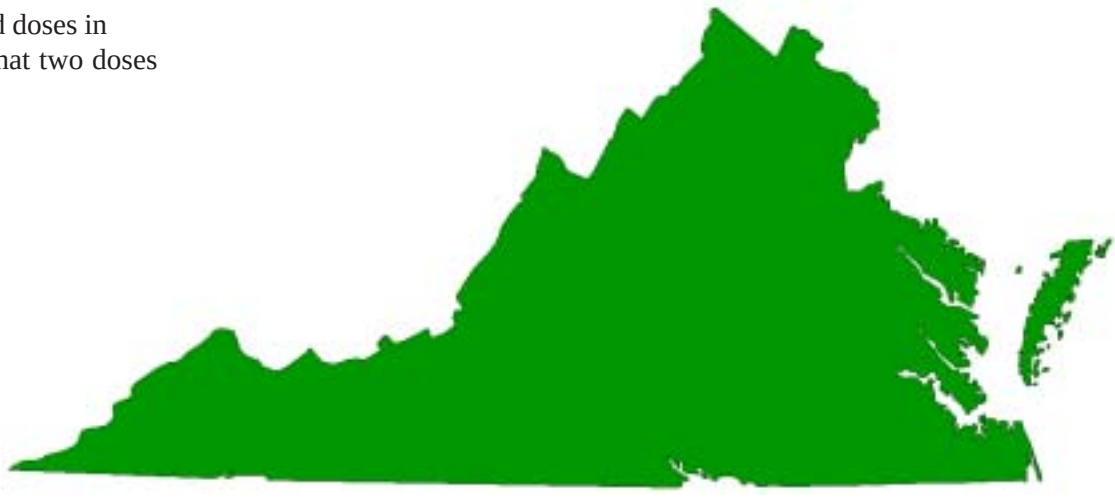
Because of concerns about influenza vaccine shortages, current recommendations from the Centers for Disease Control and Prevention for providing influenza vaccine include:

- Target inactivated vaccine to persons at high risk for complications: healthy children aged 6–23 months, adults aged ≥65 years, pregnant women in their 2nd or 3rd trimester during influenza season, and persons aged ≥2 years with underlying chronic conditions.
- Persons at high risk should be encouraged to search locally for vaccine if their usual health-care provider no longer has vaccine available.
- All children (≥6 months) at high risk should receive a first or second dose (depending on vaccination status). Do not hold doses in reserve to ensure that two doses will be available.
- Next, target those persons at greatest risk for transmission of disease to persons at high risk, including household contacts and health-care workers.
- Healthy persons aged 5–49 years should be encouraged to be vaccinated with intranasally administered live, attenuated influenza vaccine.
- Decisions about vaccinating healthy persons with inactivated influenza vaccine should be made on a case-by-case basis, depending on local disease activity, supply, etc.

Current additional recommendations include:

1. Antivirals with specific activity against influenza A should be considered for treatment or chemoprophylaxis, especially in persons at high risk for complications from influenza. Consider administering chemoprophylaxis to healthcare workers who have been vaccinated within the last two weeks and have been exposed to patients with influenza-like illness.
2. **Promote good respiratory hygiene, including cleaning of hands, and staying home when symptomatic with fever and respiratory illness.**
3. Continue to report any clusters of respiratory illness to your local health department.
4. **Initiate strict infection control procedures in hospital and outpatient facility waiting rooms**
   - Ask patients to alert staff if they have a febrile respiratory illness.
   - Provide surgical masks to patients or tissues to cover the mouth and nose.
   - Encourage patients to practice strict hand hygiene and provide alcohol-based hand sanitation products.
   - Separate patients with a febrile respiratory illness from others in the waiting areas.
   - Manage patients with droplet precautions until it is determined that the cause is a pathogen that does not require such precautions.

Remember: vaccination, chemoprophylaxis, and infection control procedures help to control the spread of influenza, especially since individuals can be infectious up to 24 hours before onset of symptoms



Cases of Selected Notifiable Diseases Reported in Virginia*

Disease	Total Cases Reported, October 2003: State	Regions: NW	N	SW	C	E	Total Cases Reported Statewide, January through October: This Year	Last Year	5 Yr Avg
AIDS	64	7	34	6	9	8	675	643	714
Campylobacteriosis	65	21	7	11	13	13	716	502	520
***E. coli* O157:H7**	1	0	0	0	1	0	33	59	59
Giardiasis	39	11	12	1	6	9	289	254	341
Gonorrhea	920	42	56	108	239	475	7,676	8,712	8,423
Hepatitis A	18	1	7	1	4	5	87	121	138
B, acute	14	1	0	5	2	6	150	162	122
C/NANB, acute	0	0	0	0	0	0	7	10	7
HIV Infection	75	3	23	5	14	30	678	764	717
Lead in Children†	101	4	7	24	47	19	667	717	579
Legionellosis	9	1	0	4	0	4	82	20	23
Lyme Disease	9	1	4	1	0	3	80	134	110
Measles	0	0	0	0	0	0	0	0	3
Meningococcal Infection	3	0	0	1	0	2	24	37	38
Mumps	0	0	0	0	0	0	1	4	7
Pertussis	3	2	1	0	0	0	86	124	63
Rabies in Animals	37	10	13	1	7	6	449	504	477
Rocky Mountain Spotted Fever	3	1	0	0	1	1	28	32	18
Rubella	0	0	0	0	0	0	0	0	<1
Salmonellosis	130	21	23	21	23	42	919	1,011	1,012
Shigellosis	70	6	6	48	7	3	388	809	357
Syphilis, Early§	10	1	2	0	1	6	138	142	249
Tuberculosis	39	6	18	0	4	11	225	232	235

Localities Reporting Animal Rabies This Month: Accomack 1 raccoon; Alexandria 3 raccoons; Arlington 4 raccoons; Augusta 1 raccoon, 1 skunk; Buckingham 1 raccoon; Charles City 1 skunk; Clarke 1 raccoon, 1 skunk; Fairfax 2 raccoons; Hampton 1 raccoon; Henrico 1 raccoon; Loudoun 1 raccoon; Mecklenburg 1 skunk; Middlesex 1 fox; Norfolk 1 raccoon; Northampton 1 raccoon; Orange 1 raccoon; Patrick 1 raccoon; Petersburg 1 skunk; Prince George 1 raccoon; Prince William 3 raccoons; Richmond City 1 raccoon; Rockingham 1 skunk; Shenandoah 2 skunks; Spotsylvania 1 raccoon; Stafford 1 raccoon; Suffolk 1 raccoon.

Toxic Substance-related Illnesses: Arsenic Exposure 2; Asbestosis 4; Lead Exposure 1; Mercury Exposure 1; Pneumoconiosis 7.

*Data for 2003 are provisional. †Elevated blood lead levels ≥10µg/dL.

§Includes primary, secondary, and early latent.

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