

Responding to Indoor Air Quality Concerns in our Schools

June 2005



DOH 333-076 June 2005

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY/TDD call 711).

Acknowledgements

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For technical questions concerning the implementation of an indoor air quality (IAQ) program within your school or school district, please contact:

Nancy Bernard, School Environmental Health & Safety Program Manager

360-236-3072

Nancy.Bernard@doh.wa.gov

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Introduction

Background

Students and school staff deserve and expect a healthy and comfortable environment in which to learn and teach. Similarly, parents expect schools to provide a healthy environment conducive to student learning and one that does not promote or exacerbate illnesses in their children. Within the school environment, reduced indoor air quality (IAQ) due to a lack of fresh air, chemical and biological contaminants, temperature, and humidity has resulted in student and staff health concerns. These concerns may be expressed as complaints of: headaches, rashes, tiredness, respiratory or eye irritation; and may result from single or multiple factors. Since individuals respond to stressors differently, it's likely that individuals that respond initially may be more sensitive than others and are in essence like the "canary in the coal mine," providing an early indication of poor or reduced IAQ. Therefore, it is important that all concerns be taken seriously and investigated thoroughly. An open and proactive response to an expressed IAQ concern can prevent a minor situation from becoming a major problem.

Considerable evidence exists supporting a relationship between poor IAQ and student learning and illness. Children spend between 80 and 85 percent of their time indoors, which includes about seven hours per day in school. Poor indoor air quality in schools is associated with increased student absenteeism and reduced student academic performance. As an example, a recent study involving Washington and Idaho schools found that classroom carbon dioxide (CO₂) concentrations greater than 1000 ppm, due to inadequate fresh make-up air, were associated with a 10 to 20 percent increase in student absenteeism. During the 1990s, the incidence of asthma in young children rose by nearly 60 percent and was responsible for ten million missed school days per year nationwide. In the mid 1990s, one in five schools across the United States, representing 8.4 million students, was identified as having IAQ problems. Furthermore, maintenance and operations budgets have declined as a percentage of school operating budgets from nearly 12 percent in 1990 to nine percent in 2000, which may contribute to poor indoor air quality in both new and aging school buildings.

Washington State has 296 school districts with more than 2,200 buildings and over one million students. While the total number of IAQ concerns reported in Washington State schools is unknown, several school districts have experienced severe IAQ events that have resulted in temporary school closures. Discussions with officials from these districts highlight the need for a clear and systematic approach that enables school administrators to quickly and effectively investigate and resolve IAQ concerns.

Purpose

The purpose of this document is to provide school and school district officials with general information and recommendations for responding to IAQ concerns. Procedures for investigating an IAQ concern are outlined along with agency roles and responsibilities. Specific contact information is provided and communication issues are discussed. Finally, links to technical information and resources are provided.

While this document is not a comprehensive guide for the establishment of an IAQ program, it is intended to complement existing materials such as the Environmental Protection Agency (EPA) *Tools for Schools* and the Washington State Department of Health (DOH) *School Indoor Air Quality Best Management Practices Manual*. This document is also not intended to be a finished product, but rather a working document, one that is evolutionary to reflect the needs, practices, and experiences of school districts in Washington State with regard to IAQ concerns. Finally, this document is not intended to provide a one-size-fits-all approach to IAQ investigations, but rather to facilitate the documentation of practices and approaches that have worked for you and others.

As partners, DOH and the Office of Superintendent of Public Instruction urge each school district to develop a plan for responding to IAQ concerns. The information contained in this document is intended to support development of such a plan as well as outline agency resources available to schools responding to IAQ concerns and to clarify the role of each.

IAQ Investigation Partners

Investigation and remediation of an IAQ concern may be as simple as identifying and removing the obvious source of an odor; or it may be complex, involving multiple individuals, observable health impacts, and the media. As investigation into an IAQ concern becomes increasingly complex, dealing with issues of coordination, communication, and investigation of site and health related issues will become more demanding and increasingly important. To respond to the demands of more complex IAQ events, multiple levels of support are available to school districts from local and state agencies including: the Local Health Jurisdiction (LHJ), the Educational Service Districts (ESD), the Office of Superintendent of Public Instruction (OSPI), and the Washington State Departments of Health (DOH) and Labor and Industries (L&I). Suggested agency responsibilities, in response to an IAQ event, are briefly described below and outlined in the subsequent diagram (Figure 1).

Schools

Local school administrators have a general responsibility to provide a school environment that is safe and conducive to learning. IAQ related responsibilities include:

- Implementing district policies and procedures for the reporting of IAQ concerns.
- Ensuring staff and students are aware of basic IAQ concern reporting procedures.
- Collecting and notifying the district risk manager of an IAQ concern in a timely manner.
- Ensuring that district staff follow-up in a timely manner.
- Informing affected individual(s) of anticipated follow-up activities and timelines.

School Districts

School districts are typically responsible for the following IAQ related activities:

- Development and adoption of district wide policies and procedures for the reporting of IAQ concerns.
- Educating school administrators on the implementation of district IAQ policies and procedures.
- Coordination and investigation of IAQ concerns.
- Compiling information and preparing investigation reports and briefings.
- Implementing communication plans and informing affected individuals.
- Requesting assistance from the LHJ and ESD as needed.
- Requesting L&I consultation on behalf of school staff.

Educational Service District (ESD)

Several ESDs in Washington State have resources available to assist member school districts with IAQ investigations in the following manner:

- Provide investigative support by trained industrial hygienists.
- Review and interpretation of air monitoring data.
- Provide support to school districts at meetings with affected staff and concerned citizens.

Local Health Jurisdiction (LHJ)

The LHJ has broad authority to preserve and protect public health, and is the first point of contact for public health issues within their jurisdiction, including IAQ events in schools.

Responsibilities related to IAQ events in schools may include:

- Providing consultation to the school district as needed.
- Assisting in the design and implementation of environmental investigations.
- Interpreting and reporting on investigation findings.
- Attending school district sponsored meetings.
- Providing recommendations.
- Contacting DOH to request further assistance as needed.

Department of Health (DOH) (School Environmental Health and Safety Program)

The DOH is Washington State's agency with a broad mandate to protect public health. DOH has staff with expertise on environmental health related issues including: IAQ, environmental epidemiology, toxicology, and risk communication. Upon notification of a school IAQ event, DOH can provide the following services as needed:

- General support and consultation.
- Coordination of health related investigations among participants.
- Follow-up toxicology and epidemiologic investigations.
- Interpretation of health and environmental data.
- Provide technical and policy recommendations.
- Attend meetings as requested.

Office of Superintendent of Public Instruction (OSPI)

OSPI is the state agency overseeing the public education system in Washington State. As such, OSPI has broad administrative and support responsibilities. With regard to IAQ, OSPI is a partner with DOH and other state agencies in addressing policy and resource requirements to support student health and safety. IAQ concerns impact:

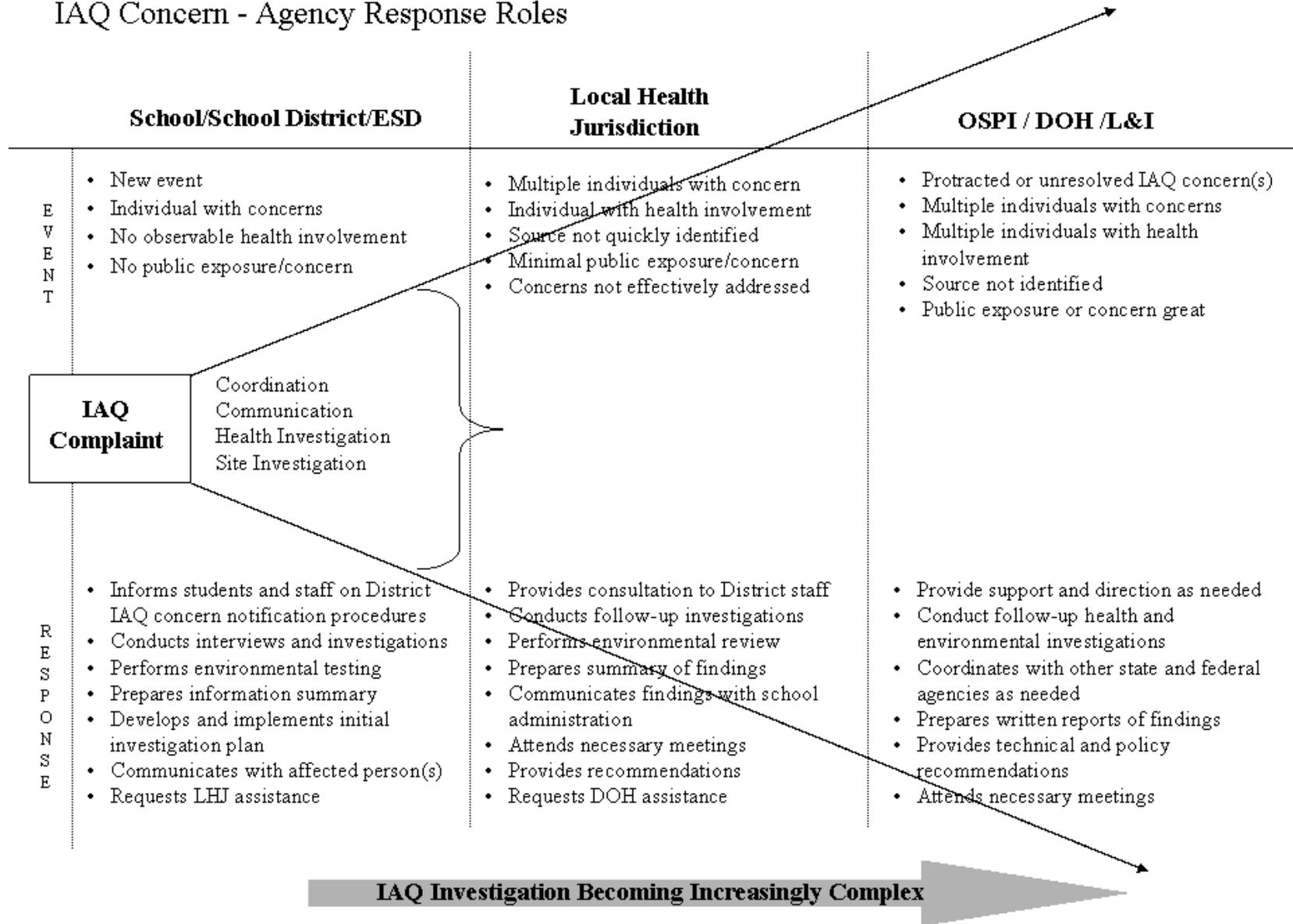
- Student achievement.
- School facility design and maintenance.
- Allocation of district resources.

Department of Labor & Industry (L&I)

L&I is a diverse state agency dedicated to the safety, health, and security of Washington's workforce. In response to an IAQ event, the district can request that L&I conduct a consultative investigation. For further information, please go to:

<http://www.lni.wa.gov/Safety/Topics/AtoZ/IndoorAir/default.asp>

Figure 1
 IAQ Concern - Agency Response Roles



IAQ Investigation Procedure

Facility maintenance personnel or administrators may be alerted to potential IAQ problems during a seemingly casual conversation with a building occupant. The concerns may be vague, perhaps to the effect that one or more people feel “sick” or “uncomfortable,” or that someone has noticed an “unusual odor.” They may be specific, blaming a particular material as the cause of their discomfort or health problems. Concerns are typically expressed due to sincere feelings, so these concerns should be taken seriously. However, individuals may attribute their concerns or symptoms to the wrong cause, so their theories about the problem should be heard respectfully, but weighed cautiously.

The following *IAQ Investigation* flow diagram (Figure 2) presents steps to be considered during the investigation of an IAQ concern **as well as communication and requests for additional technical support**. Typically, most IAQ matters are quickly referred to school district staff following report of the concern. Due to the differing levels of IAQ response expertise between schools, school districts, and ESDs; the pace with which an investigation proceeds and the need for additional agency involvement, will vary between districts. Because of this variability, investigation procedures should be tailored to your district’s specific organizational needs. As a starting point for development of an investigation procedure, example *Concern Registration* and *Initial Assessment* forms (Figures 3 and 4) are provided for your use and/or modification.

The first source for external assistance in dealing with an IAQ issue is the LHJ. It is important that school district or ESD officials first contact and request assistance from the LHJ due to their significant environmental health expertise as well as their knowledge and rapport with the communities they serve. Active early involvement of the LHJ and that of the Health Officer are essential components of an effective IAQ response plan.

In the event that DOH is requested to assist in the investigation of an IAQ concern, the state IAQ Response Outline will be followed (see Appendix I), beginning with consultation with the LHJ and OSPI. Each succeeding level of involvement by DOH results in greater time and resource involvement, and is intended to provide an efficient and systematic approach to resolving IAQ concerns. In the event that a potential disease cluster is suspected, a specific investigation protocol (see Appendix II) may be implemented by DOH.

Figure 2
IAQ Investigation Procedure

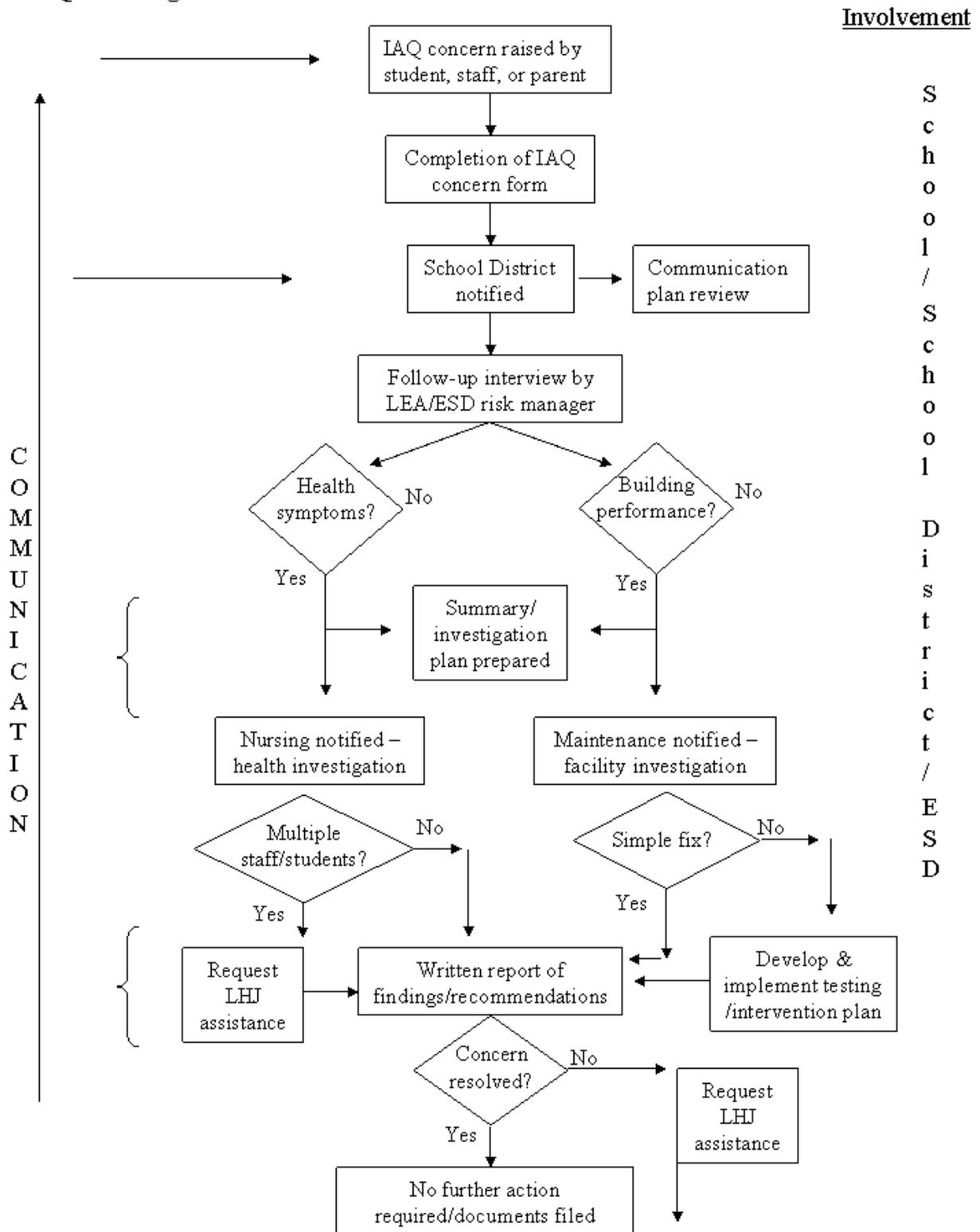


Figure 2 Continued
 IAQ Investigation Procedure

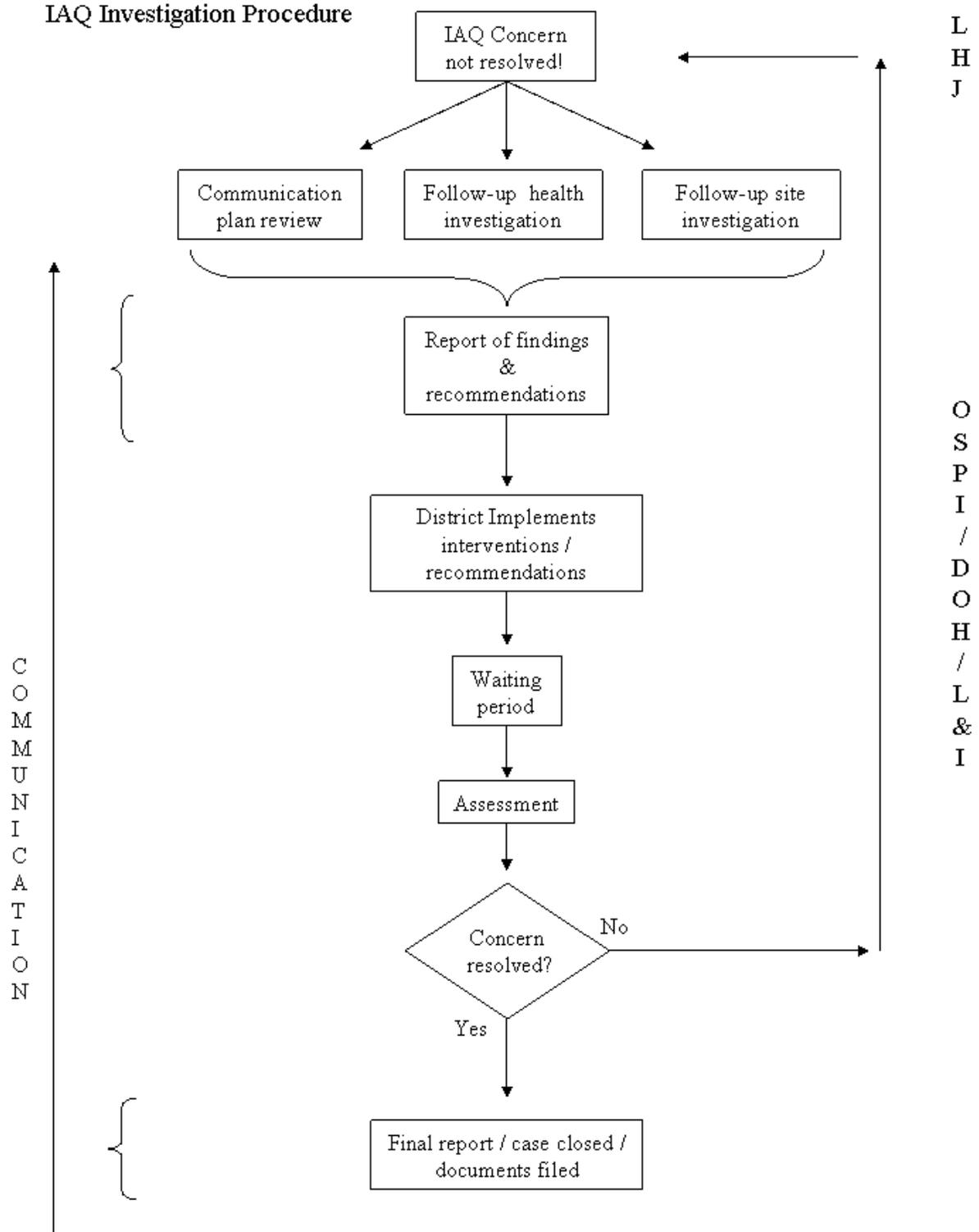


Figure 4

INITIAL ASSESSMENT FORM

SCHOOL	ROOM NUMBER / AREA	DATE
CONTACT PERSON (NAME AND TITLE)	PHONE	
FORM COMPLETED BY (NAME AND TITLE)	PHONE	
RESTATED INCIDENT / PROBLEM (include as much detail as possible; e.g., duration, time of day/year, frequency, fluctuation in intensity):		

CHECK IDENTIFIED INCIDENT/PROBLEM SOURCE(S) WHEN CONCLUSIVE

THERMAL
<input type="checkbox"/> TEMPERATURE <input type="checkbox"/> HOT <input type="checkbox"/> COLD <input type="checkbox"/> HUMIDITY <input type="checkbox"/> CONTROL MALFUNCTION <input type="checkbox"/> POOR VENTILATION <input type="checkbox"/> OTHER / UNKNOWN

DAMPNESS
<input type="checkbox"/> CRAWL SPACE <input type="checkbox"/> CEILINGS <input type="checkbox"/> WALLS <input type="checkbox"/> FLOORS <input type="checkbox"/> PLUMBING <input type="checkbox"/> WINDOWS <input type="checkbox"/> DRAINAGE <input type="checkbox"/> VISIBLE MOLD

ODORS / FUMES / DUST
<input type="checkbox"/> ROOM <input type="checkbox"/> ADJACENT AREAS <input type="checkbox"/> OUTDOORS <input type="checkbox"/> HVAC <input type="checkbox"/> DAMPNESS <input type="checkbox"/> STUFFY AIR <input type="checkbox"/> OTHER / UNKNOWN

NOISE / VIBRATION
<input type="checkbox"/> ADJACENT AREAS <input type="checkbox"/> OUTDOORS <input type="checkbox"/> BALLASTS <input type="checkbox"/> HVAC

LIGHTING
<input type="checkbox"/> GLARE <input type="checkbox"/> INTENSITY <input type="checkbox"/> CONTROLS <input type="checkbox"/> BLINDS <input type="checkbox"/> TASKS

ACTION / RESPONSE: IDENTIFIED	<input type="checkbox"/> CAUSE NOT IDENTIFIED
FORWARDED TO:	

Communication and IAQ Events

Fundamental to addressing IAQ concerns and avoiding the evolution of a seemingly insignificant and isolated concern into a community-wide issue, is the need to respond to every concern in a timely, respectful, thorough, and open manner. Regardless of how insignificant an IAQ concern may initially appear, a professional investigative approach by school district staff is warranted in order to define the issue, avoid further illness or discomfort, promote teaching and education, and build trust and respect among staff, parents, and administrators within the school facility. The greatest error that a school administrator can make following the filing of an IAQ concern is to underestimate the problems that can result if building occupants or parents believe that no action is taking place or that important information is being withheld. Promoting open communication and problem solving helps to ensure the support and cooperation of building occupants and parents as the concern is investigated and resolved.

In responding to an IAQ concern, the need for a communication plan cannot be over emphasized. Such a plan, tailored to IAQ events, should identify key messages, target audiences, and the message dissemination format. To assist you in the development of such a plan, we have included an IAQ communication plan outline following this discussion. It is recommended that the school district's communication plan be reviewed upon receipt of an IAQ concern and that the plan be implemented, earlier rather than later, in order to minimize anxiety and to build trust. As part of the communication plan, staff and parents should initially be provided with the following information as is reasonable:

- Nature of IAQ concern(s).
- School or district policies for investigation of the concern.
- Activities to date.
- Plan of action.
- Risk manager contact information to address follow-up questions or concerns.

In addition, it is recommended that school districts inform parents and staff annually, through a letter or other means, of the district's procedures for receiving and investigating health and safety concerns.

IAQ Communication Plan Outline

1. Communication Plan Goals

- Build and maintain staff and community confidence in the school and the school district's ability to respond to, and effectively manage, an IAQ investigation.
- Provide accurate, rapid, and complete information to calm fears and maintain a sense of order.
- Rapidly provide staff, the community, and the media access to accurate, consistent, and comprehensive information about the IAQ investigation.
- Address as quickly as possible rumors and inaccuracies.
- Provide accurate, consistent and highly accessible information and materials through the coordination of communication efforts with other state and local support agencies.
- Provide accurate, consistent, and highly accessible information and materials to internal staff to ensure clarity of roles and responsibilities.
- Consider diverse audience needs in providing accessible information.

2. Communication Plan Elements

Communication plans and activities should include:

- **Proactive Education** – Prepare staff, supporting partners, community, and other key audiences with information on your IAQ investigation protocol to minimize rumors and inaccuracies.
- **Response Planning** – Planning efforts include clear communication and message approval channels to ensure rapid and coordinated information flow.
- **Effective and Coordinated use of Resources** – Communication plan should provide support for all schools and should be coordinated among supporting partners.
- **Event Response** – Systems for effective information dissemination to key partners, staff, students, and possibly the community.
- **Special Population Messages** – Develop messages and communication channels for a range of audiences including: parents/children, non-English speakers, and community groups.
- **Frequently Asked Questions** – Establish systems and methods for rapidly identifying, tracking and responding to staff, student, community, and media concerns and questions.
- **Coordinated Information** – Provide one public health voice through the coordination of local and state public health agencies.
- **Ongoing Resources for the Public** – The school district's web site will play a key role in providing updates, fact sheets, meeting times and community education materials. Additional resources could include media education and outreach, community emergency information line, qualified speakers, and materials/outreach efforts targeting specific audiences.
- **Ongoing Communication Dissemination** – Ensure staff are up-to-date on all aspects of the investigation and that they are aware that their health concerns are being taken seriously.

3. Risk Communication Principles

To effectively address staff and parent concerns and fears, the following “crisis communication principles” outlined by the Centers for Disease Control and Prevention (CDC) are recommended:

- Adopt a policy of full disclosure about what is and is not known.
- Provide detailed accounting of what is being done to address and identify the IAQ concern.
- Recommend specific steps people can or should take to improve IAQ in their work environment.
- Avoid speculation.
- Provide information to the community in non-technical language, without jargon or acronyms.
- Avoid issuance of statements or information that conflicts with information provided by other investigation partners.
- Deliver information in a non-patronizing manner.

Contact Directory

The following directory contains contact information for DOH, OSPI, and LHJs.

Department of Health (DOH):

Tim Hardin, Manager - Indoor Air Quality Program

360-236-3363 FAX: 360-236-2261

Tim.Hardin@doh.wa.gov

Laura A. White, Indoor Air Quality Program

360-236-3090 FAX: 360-236-2261

Laura.White@doh.wa.gov

Nancy P. Bernard, Manager – School Environmental Health & Safety Program

360-236-3072 FAX: 360-236-2261

Nancy.Bernard@doh.wa.gov

Office of Superintendent of Public Instruction

Marcia L. Riggers, Assistant Superintendent – Student Support

360-725-6175

mriggers@ospi.wednet.edu

Martin Mueller, Director – Learning and Teaching Support

360-725-6050 FAX: 360-664-3575

mmueller@ospi.wednet.edu

WASHINGTON STATE LOCAL HEALTH JURISDICTIONS (2005)



-  Local Health Jurisdiction
-  County Boundary
-  Federally Designated American Indian Reservation

The Washington State Department of Health (DOH) does not warrant the accuracy, reliability or timeliness of any information published in this map and assumes no responsibility for errors in the content of the information provided. Persons or entities that rely on any information obtained from this map do so at their own risk.



March 24, 2005
 Created with ArcGIS 9.0
 craig.ericson@doh.wa.gov

Adams County Health Department

<http://www.co.adams.wa.us/health/default.aspx>

108 West Main

Ritzville, WA 99169-1408

Phone: (509) 659-3315

Fax: (509) 659-4109

Asotin County Health District

<http://www.co.asotin.wa.us/health.html>

431 Elm Street

Clarkston, WA 99403

Phone: (509) 758-3344

Fax: (509) 758-8454

Benton-Franklin Health District

<http://www.bfhd.wa.gov/base/index.php>

471 Williams Boulevard

Richland, WA 99352

Phone: (509) 943-2614

Fax: (509) 546-2916

Chelan-Douglas Health District

<http://www.cdhd.wa.gov/index.asp>

200 Valley Mall Parkway

East Wenatchee, WA 98802

Phone: (509) 886-6450

Fax: (509) 886-6449

Clallam County Department of Health and Human Services

<http://www.clallam.net/healthservices/>

223 East 4th Street Suite 14

Port Angeles, WA 98362-0149

Phone: (360) 417-2274

Fax: (360) 417-2519

Clark County Health Department

<http://www.clark.wa.gov/health/index.html>

2000 Fort Vancouver Way

PO Box 9825

Vancouver, WA 98666

Phone: (360) 397-8215

Fax: (360) 397-8424

Columbia County Public Health District

http://www.doh.wa.gov/LHJMap/No_Web.htm#Columbia

1010 South 3rd

Dayton, WA 99328

Phone: (509) 382-2181

Fax: (509) 382-2942

Cowlitz County Health Department

<http://www.co.cowlitz.wa.us/health>

1952 9th Avenue

Longview, WA 98632-4045

Phone: (360) 414-5599

Fax: (360) 425-7531

Garfield County Health District

http://www.doh.wa.gov/LHJMap/No_Web.htm#Garfield

121 South 10th

PO Box 130

Pomeroy, WA 99347

Phone: (509) 843-3412

Fax: (509) 843-1935

Grant County Health District

<http://www.granthealth.org/>

County Courthouse

1st & C Street NW

PO Box 37

Ephrata, WA 98823

Phone: (509) 754-6060

Fax: (509) 754-0941

Grays Harbor County Public Health and Social Services Department

http://www.co.grays-harbor.wa.us/info/pub_svcs/envhealth.html

100 West Broadway, Suite 31

Montesano, WA 98563

Phone: (360) 249-4413

Fax: (360) 249-3203

Island County Health Department

<http://www.islandcounty.net/health/>

Courthouse Annex

6th & Main Streets

PO Box 5000

Coupeville, WA 98239-5000

Phone: (360) 679-7350

Fax: (360) 679-7390

Jefferson County Health and Human Services

<http://www.co.jefferson.wa.us/health/default.htm>

615 Sheridan Street

Port Townsend, WA 98368

Phone: (360) 385-9400

Fax: (360) 385-9401

Kitsap County Health District

<http://www.kitsapcountyhealth.com/>

109 Austin Drive

Bremerton, WA 98312

Phone: (360) 337-5235

Fax: (360) 337-5298

Kittitas County Health Department

<http://www.co.kittitas.wa.us/health/>

411 N. Ruby St., Suite 3

Ellensburg, WA 98926-2898

Phone: (509) 962-7698

Fax: (509) 962-7052

Klickitat County Health Department

<http://www.klickitatcounty.org/health/>

228 West Main Street

MS CH-14

Goldendale, WA 98620

Phone: (509) 773-4565

Fax: (509) 773-5991

Lewis County Public Health

<https://fortress.wa.gov/lewisco/home/DesktopDefault.aspx?tabindex=161&tabid=115>

North Street

MS: HSD03

Chehalis, WA 98532-1900

Phone: (360) 740-1223

Fax: (360) 740-1472

Lincoln County Health Department

<http://www.co.lincoln.wa.us/Public%20Health/index.htm>

90 Nichols

Davenport, WA 99122

Phone: (509) 725-2501

Fax: (509) 725-1014

Mason County Department of Health Services

<http://www.co.mason.wa.us/envhealth/default.shtml>

303 North Fourth

PO Box 1666

Shelton, WA 98584

Phone: (360) 427-9670

Fax: (360) 427-7798

Northeast Tri-County Health District

<http://homepage.plix.com/tricohealth/>

240 East Dominion

PO Box 270

Colville, WA 99114-0270

Phone: (509) 684-2262

Fax: (509) 684-1002

Okanogan County Public Health

<http://www.okanogancounty.org/ochd/index.htm>

Public Services Building

1234 South 2nd Avenue

PO Box 231

Okanogan, WA 98840

Phone: (509) 422-7140

Fax: (509) 422-7142

Pacific County Public Health and Human Services Department

<http://www.co.pacific.wa.us/health/index.htm>

1216 West Robert Bush Drive

PO Box 26

South Bend, WA 98586

Phone: (360) 875-9343

Fax: (360) 875-9323

Public Health – Seattle and King County

<http://www.metrokc.gov/health>

Environmental Health Division

Wells Fargo Center

999 Third Avenue Suite 700

Seattle, WA 98104-4099

Phone: (206) 296-4806

San Juan County Department of Health and Community Services

<http://www.co.san-juan.wa.us/apages/health.asp>

145 Rhone Street

PO Box 607

Friday Harbor, WA 98250-0607

Phone: (360) 378-4474

Fax: (360) 378-7036

Skagit County Department of Health

<http://www.skagitcounty.net/health>

700 South 2nd Street #301

PO Box 91071

Mount Vernon, WA 98273-1071

Phone: (360) 336-9380

Fax: (360) 336-9401

Skamania County Health Department

683 SW Rock Creek Drive

PO Box 162

Stevenson, WA 98648

Phone: (509) 427-5138

Fax: (509) 427-5272

Snohomish Health District

<http://www.snohd.org/>

3020 Rucker Avenue
Everett, WA 98201-3900
Phone: (425) 339-5210
Fax: (425) 339-5216

Spokane Regional Health District

<http://www.srhd.org/>

West 1101 College Avenue
Spokane, WA 99201-2095
Phone: (509) 324-1500
Fax: (509) 324-1507

Tacoma-Pierce County Health Department

<http://www.tpchd.org/>

3629 South D Street
Tacoma, WA 98418-6813
Phone: (253) 798-6500
Fax: (253) 798-7627

Thurston County Public Health and Social Services Department

<http://www.co.thurston.wa.us/health/welcome.html>

2000 Lakeridge Drive SW
Olympia, WA 98502
Phone: (360) 786-5455
Fax: (360) 754-4462

Wahkiakum County Department of Health and Human Services

http://www.doh.wa.gov/PHIP/phdirectory/lhj/wahkiakum/wahkiakum_eh.htm

64 Main Street
PO Box 696
Cathlamet, WA 98612
Phone: (360) 795-6207
Fax: (360) 795-6143

Walla Walla County Health Department

<http://www.co.walla-walla.wa.us/departments/health/health.htm>

310 West Popular

PO Box 1753

Walla Walla, WA 99362-0336

Phone: (509) 527-3290

Fax: (509) 527-3264

Whatcom County Health Department

<http://www.whatcomcounty.us/health>

509 Girard Street

PO Box 935

Bellingham, WA 98227-0935

Phone: (360) 676-6720

Fax: (360) 676-7646

Whitman County Health Department

<http://www.whitmancounty.org/pubhealth>

Public Service Building

North 310 Main Street

Colfax, WA 99111-1893

Phone: (509) 397-6280

Fax: (509) 397-6239

Yakima Health District

<http://www.co.yakima.wa.us/health/default.html>

104 North First Street

Yakima, WA 98901-2667

Phone: (509) 575-4040

Fax: (509) 575-7894

Internet Resource Directory

The following Internet sites have been identified as containing valuable content relevant to school IAQ.

- *Compendium of Measures To Prevent Disease and Injury Associated with Animals in Public Settings*, 2005
<http://www.nasphv.org/83416/84501.html>
- DOH Indoor Air Quality Program
<http://www.doh.wa.gov/ehp/ts/iaq.htm>
- DOH School Environmental Health & Safety Program
<http://www.doh.wa.gov/ehp/ts/school.htm>
- *DOH School Indoor Air Quality Best Management Practices Manual*, Revised 2003
<http://www.doh.wa.gov/ehp/ts/IAQ/schooliaqbmp.pdf>
- *DOH/OSPI K12 Health & Safety Guide*, January 2003
<http://www.k12.wa.us/SchFacilities/HealthSafetyGuide.aspx>
- EPA's *IAQ Tools for Schools*
<http://www.epa.gov/iaq/schools/index.html>
- EPA's *IAQ Tools for Schools Communications Guide*
http://www.epa.gov/iaq/schools/images/communication_guide.pdf
- *IAQ in Northwest Schools* free on-line quarterly newsletter
http://www.energy.wsu.edu/projects/building/iaq_nl.cfm
- *OSPI/DOH Infectious Disease Guide for School Staff*, April 2004
<http://www.k12.wa.us/healthservices/pubdocs/InfectiousDiseaseControlGuide3-11-04.pdf>
- School Integrated Pest Management
<http://www.ecy.wa.gov/programs/swfa/upest/>
- Washington State Board of Health Primary & Secondary School Regulations
<http://www.leg.wa.gov/wac/index.cfm?fuseaction=chapterdigest&chapter=246-366>
- Washington State University Cooperative Extension: Indoor Air Quality Program.
<http://www.energy.wsu.edu/projects/building/iaq.cfm>

APPENDIX I.

State IAQ Response Outline

Level 1	DOH Notified of IAQ Concern <ul style="list-style-type: none"> • LHJ consulted on current status of IAQ investigation. • Number of staff/students involved. • Level of concern. • Communication between participants. • Coordination between participants. • Available data and activities reviewed. • Response recommendations provided to LHJ. • DOH notifies OSPI of status and recommendations. 	All reports routed through DOH IAQ program manager for coordination and response and to ensure LHJ involvement.
Level 2	DOH Site Visit Requested (concerns unresolved) <ul style="list-style-type: none"> • DOH coordinates site visit through LHJ. • Detailed review of existing information. • Health data. • Facilities operational and testing data. • Facility walk-through conducted. • Concerned citizens/staff/students consulted. • Investigation plan reviewed and updated. • Communication plan reviewed. • Recommendations provided. • OSPI notified of events and status. 	DOH provides on-site assistance to LHJ and school district staff to more clearly define concern cause and remedial actions.
Level 3	DOH Given Investigative Lead (concerns unresolved/increase) <ul style="list-style-type: none"> • Available data reviewed and interviews conducted. • Communication and coordination plans reviewed. • Initiation of epidemiologic cluster investigation and/or environmental studies reviewed. • Data analyzed and recommended actions implemented. • Outcome assessment conducted. • Meetings attended as needed. • OSPI notified of events and status. 	Staff from DOH Environmental Health Programs collect and review additional information as needed.
Level 4	DOH Conducts Enhanced Investigation (concerns unresolved/increase) <ul style="list-style-type: none"> • Departmental review of findings and recommendations. • Assessment of prior actions and outcomes. • Investigation plan reviewed and updated. • Investigative recommendations implemented. • Data reviewed and remedial actions taken. • Outcome assessment conducted. • OSPI notified of events and status. 	DOH Health Officer and additional epidemiology and toxicology staff consulted.

Note: Under present Washington State law and regulations, the LHJ has the authority to investigate and to cause improvements to be made. At present (2005) not all LHJs have the resources to act in an advisory and consultative capacity on IAQ issues. DOH involvement is with the permission and support of the LHJ, when LHJ resources are not adequate or available

APPENDIX II

Investigating Disease Clusters

Investigation: DOH has a standardized approach, commonly referred to as the "Cluster Investigation Protocol," for the investigation of non-infectious disease events. The primary purpose of this protocol is to provide a framework for the investigation of cluster occurrences. In addition, these protocols provide for a coordinated and standardized response from DOH employees receiving calls from the public, health professionals, or others about potential disease clusters. This process generally parallels the cluster investigation guidelines published by the Centers for Disease Control and Prevention (CDC). An outline of the DOH "Cluster Investigation Protocol" is provided below.

Intervention: It is important that any intervention be based on scientific evidence so as to avoid unnecessary waste of limited resources. Based on data collected during the investigation phase, interventions may be identified early on, or possibly not at all, if no etiological mechanism for the disease is defined.

Outcome Assessment: The outcome assessment phase is essential, although often excluded. An outcome assessment is necessary to determine the efficacy of intervention activities and/or changes in population health status.

Overview of DOH Cluster Investigation Protocols

Stage 1: Collect Initial Information and Provide Education and Information to the Informant.

- Type of illness(es).
- Number of people reported with the same illness.
- The ages of the people affected.
- Time period during which people became ill.
- Where the alleged cluster has occurred.
- Whether the caller suspects a specific environmental exposure.
- Others the caller contacted about the cluster (include other DOH personnel and other agencies).
- Organizational affiliation of the caller (e.g., health official, private physician, concerned citizen, employer representative, etc.).

Decision Point I: (close the case or investigate further)

Criteria:

- There are at least three cases of the same or similar conditions with regard to person, place and time, **and**
- A specific exposure of concern, including a potential route of exposure, is alleged as the cause of the cluster.

Stage 2a: (Assess the Magnitude of the Reported Cluster)

A preliminary assessment is conducted to provide a rough estimate of the likelihood that a statistically significant excess in the disease or condition has occurred.

Assessment Steps

1. Development of initial case definition and disease/condition review (natural history of disease, risk factors, background rates, etc.).
2. Additional case information ascertainment and diagnosis confirmation.
3. Exposure investigation including literature review to determine plausible cause.
4. Preliminary calculation of rates and observed vs. expected numbers of disease occurrence.
5. Define the appropriate geographic area and time period associated with the suspect cluster.
6. Determination of the most appropriate reference population available using pre-existing data.

Decision Point 2: (close the case or investigate further)

Criteria:

- At least three cases of the same condition.
- Data analysis suggests an excess of cases, and **one or more** of the following:
 - The disease is of known etiology and exposure to the causal agent may exist.
 - The reported exposure has previously been associated with the reported condition.
 - The disease is of unknown etiology and unusual exposures exist in this instance (i.e., these exposures are unique to an area or an occupation and are not commonly found in the US).
 - The disease is extremely rare.

Stage 2b: (Verify initial assessment)

The goal of this step is to verify the initial assessment with a more refined analysis of both health and environmental data.

Assessment Steps:

1. If indicated, refine the geographic area and time period of interest.
2. Obtain information on all reported cases to verify diagnosis, time of onset and exposure profile.
3. If necessary, refine the case definition.
4. Expand case ascertainment through active case finding.
5. Recalculate disease/condition rates and observed vs. expected number of case base on new information.
6. Reassess exposure data and potential exposure pathways.
7. Review of existing information regarding other risk factors for the condition (e.g., lifestyle or genetic factors).

Decision Point 2: (close the case or investigate further)

Typically, **ALL** of the following criteria must be met in order to proceed to the next level of investigation.

Criteria:

- At least five cases of the disease.
- An O/E ratio (the ratio of the number of observed cases of the disease to the number of expected cases) that decreases as the number of cases increases.
- Redemption of the suspect problem is possible and likely to have a positive public health impact.
- For diseases of known or suspected etiology, there must be a plausible exposure and route of exposure, including proper latency between the exposure and the onset of disease.

For diseases of unknown etiology:

- There must be a unique exposure (i.e., an exposure which is not commonly found in the US) and a plausible route of exposure, **AND**
- The weight of the evidence from scientific literature should suggest an association between the disease and the suspect exposure.

Stage 3: (Determine Utility and Feasibility of Further Epidemiologic Study)

The goal of this stage is to determine the feasibility of performing an epidemiologic study linking the health event and a putative exposure, and include the following steps:

1. Consideration of appropriate study designs.
2. Determine what data should be collected, including environmental samples and physical and laboratory measurements.
3. Consideration of the potential social, financial, and environmental implications of different decisions and study outcomes.
4. Estimated total resources required by the study itself and by alternative study findings.

NOTE: According to Rothman (AJE, 1990) systematic studies of clusters of diseases are not likely to be feasible unless:

- The disease is extremely rare, **AND**
- The frequency of the disease has suddenly increased, **OR**
- The environmental agent persists in the environment, **AND**
- It is detectable and measurable.

¹EPA. 2000. Indoor air quality and Student Performance. EPA 402-F-00-009.

²CDC. 1990. *Recommendations and Reports* series of Morbidity and Mortality Weekly Report (MMWR)