**Office of Neighborhood Involvement
Neighborhood Inspections Program
Database Development**

Prepared by Multnomah County Health Department
Environmental Health
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BACKGROUND: Agency profiles and partnership

Neighborhood Inspections Program

The Office of Neighborhood Involvement's Neighborhood Inspections Program enforces Title 29, the Property Maintenance Code of the City of Portland. This Code is designed and was passed by City Council to reflect the wishes of the neighborhood and the goals of Portlanders. This Code covers the maintenance of residential dwellings, accessory structures and the land on which they sit. This Title is set up to establish and enforce minimum standards only. Codes are enforced through incremental enforcement. More than just formal enforcement, inspectors and staff provide education and referrals to assist the homeowner toward the common goal of better housing. In the event of non-compliance this department is set up with tools to gain compliance. While primary efforts are toward public safety, part of the mission is the protection of property and contributions to neighborhood livability.[1]

Multnomah County Health Department (MCHD)

The MCHD recently completed a county-wide environmental health needs profile driven by community participation and coalition support using an assessment tool called the Protocol for Assessing Community Excellence in Environmental Health (PACE EH). The PACE EH assessment tool was developed by the Centers for Disease Control and Prevention and the National Association of County and City Health Officials to help communities identify both environmental health concerns and solutions at the local level. Through multiple strategies of area data analysis and mapping, neighborhood gatherings, focus groups, and surveys, a cluster of Portland residents with specific needs surfaced. Eight properties in N/NE Portland participated in the assessment which revealed environmental health and housing issues of concern to them. These included mold/mildew, lead exposure, trash/debris, and the overarching theme of not having a community voice. Recognizing that residents and affordable housing properties have a critical need for interventions that support healthy living environments, as the occupants generally have limited means to reduce their exposures to indoor health hazards and with the knowledge that the association between substandard housing and health has been well established [2,3,4,5,6], the MCHD Environmental Health (EH) has begun to take multiple avenues towards improving environmental health awareness, practices, and building principles in low income housing.

One of these approaches stemmed from an interest in exploring local trends around complaint driven inspections. MCHD EH hypothesized that by understanding the root of these trends, a link between structural/building code violations and poor health outcomes might surface and be used as evidence for intervention. As ONI's Neighborhood Inspections Program is the entity responsible for building code enforcement, a partnership was sought to explore their processes for documenting inspections and to explore the option for a retrospective look at recent housing inspection trends. It was then discovered that a database that enabled more advanced functions for review and trend analysis might benefit ONI

and the general public. At this time, the Oregon Department of Human Services released a notice of funding for projects that supported their vision of a statewide effort working to connect environmental hazards with human health outcomes in Oregon.[7] This obvious link resulted in a one year grant funded project who's goals aim to 1) develop and implement culturally specific outreach strategies to communicate indoor Environmental Health data to the North/Northeast Portland community in order to improve community awareness, input and reporting, and 2) to develop a plan to use ongoing housing inspections to track health-related environmental conditions in a uniform way and maintain an electronic database of this surveillance. This report focuses on the methods and results of a project under goal 2.

DATABASE DEVELOPMENT

Methods

223 MS-Word documents were obtained from the Office of Neighborhood Involvement. The documents represented inspections of multi-family dwellings in Multnomah County between 7/1/2003 and 6/30/2004. Each document was in a similar general format, allowing the capture of address, case number, tax lot number, and date of inspection. In some cases, when an inspection was for more than a single unit, a specific unit or apartment number was specified. By searching the keywords "Unit" and "Apartment", an attempt was made to further delineate inspections to individual units. Approximately 188 of the inspections contained no evidence of multiple unit inspections. Of the remaining 35 inspection documents, somewhere in the range of 95-123 units were inspected. The approximate total of units inspected was in the range of 286-311

Accompanying the documents was a spreadsheet containing 223 rows of data, one row for each inspection. The spreadsheet contained a field indicating the size category of the multifamily building. Only two categories were specified "3-10" and "11+". Of the inspections represented, 100 were in the category "3-10", and the remaining 123 were in the category "11+".

An MS-Access process was created to generate a list of violations and/or statutes cited from the inspection documents. Each violation record contains the identifying case/address information, and the original text of the citation and the specific Title 29 statute cited. A total of 1,781 statutes were cited in the 223 inspections. A list of keywords was constructed (Table. 1),

Table. 1 Keywords

Category	Keyword
AQ	crawl space wet
AQ	faucet leaks
AQ	lines leak
AQ	mildew
AQ	moisture
AQ	moisture penetration
AQ	mold
AQ	plumbing leak
AQ	toilet tank leaks
AQ	ventilation
AQ	ventilation fan
AQ	water damage
AQ	water is leaking
lead	bare wood
lead	peeling paint
pest	ant
pest	cockroach
pest	infestation
pest	insect
pest	mouse
pest	rodent
trash	debris
trash	dumpster
trash	garbage
trash	trash

and a process created to search the text of each citation for the keywords. Each keyword was assigned a category designator (AQ = Air quality, Lead, Pest, or Trash).

Results

Key Findings - Specific to the Indoor Air Quality (IAQ) issues of interest, mold/mildew, lead, and trash/debris, 173 units had *one or more* violations relating to water leakage, mold/mildew, lead, trash or insect/rodent infestation, resulting in 55% - 60% of all units cited with a violation containing an IAQ keyword. When broken down by IAQ:

- 121 units had citations involving severe water leakage which could lead to or there already existed mold/mildew problems

- 17 units had citations involving exterior bare wood exposed and evidence of peeling paint (potential lead issues)

- 71 units had citations involving insect or rodent infestation

- 52 units had citations involving trash/debris/unsanitary conditions

619 (or 35%) of the total 1781 violations cited contained a keyword indicating a potential IAQ problem. This revealed that approximately 35% of the 1781 total violations for that fiscal year may yield a potential health association.

Table 2 presents the summary of keywords by frequency in 1,781 citations.

Table 2 Keyword Summary

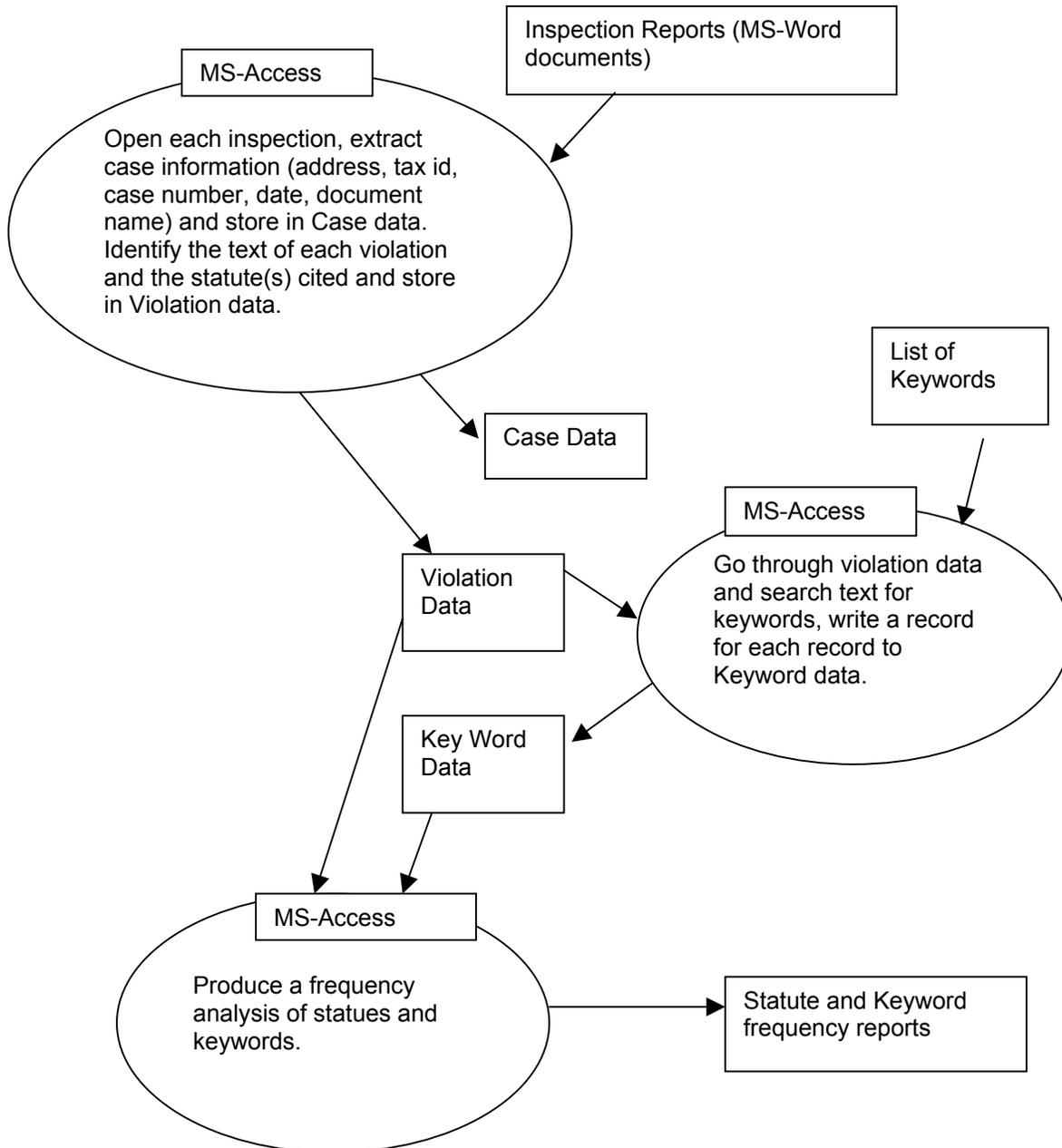| Category	Keyword	Count
AQ	faucet leaks	19
AQ	lines leak	22
AQ	mildew	18
AQ	moisture	73
AQ	moisture penetration	23
AQ	mold	67
AQ	plumbing leak	9
AQ	toilet tank leaks	1
AQ	ventilation	68
AQ	ventilation fan	2
AQ	water damage	19
AQ	water is leaking	7
lead	bare wood	18
lead	peeling paint	7
pest	ant	67
pest	cockroach	15
pest	infestation	33
pest	insect	9
pest	mouse	10
pest	rodent	21
trash	debris	54
trash	garbage	12
trash	trash	45

The primary statute cited was isolated from the text of each citation and summarized in order of statue number (Table 3) *Note: some statutes have been omitted either because of lack of relevancy or an incorrect/unknown statue was cited.*

Table 3 Primary Statute Summary

Primary Statute	Description	Count
29.20.010	Outdoor Maintenance Requirements	1
29.20.020	Other Endangering Conditions	1
29.30.020	Accessory Structures	10
29.30.030	Roofs	81
29.30.040	Chimneys	4
29.30.050	Foundations and Structural Members	15
29.30.060	Exterior Walls and Exposed Surfaces	74
29.30.070	Stairs and Porches	27
29.30.080	Handrails and Guardrails	37
29.30.090	Windows	129
29.30.100	Doors	115
29.30.110	Interior Walls, Floors, and Ceilings	242
29.30.120	Interior Dampness	54
29.30.130	Insect and Rodent Harborage	36
29.30.140	Cleanliness and Sanitation	58
29.30.150	Bathroom Facilities	2
29.30.160	Kitchen Facilities	1
29.30.170	Plumbing Facilities	230
29.30.180	Heating Equipment and Facilities	100
29.30.190	Electrical System, Outlets, and Lighting	152
29.30.200	Ceiling Heights	3
29.30.220	Overcrowding	1
29.30.230	Emergency Exits	46
29.30.240	Smoke Detectors	120
29.30.250	Fire Safety Conditions for Apartment Houses	39
29.30.260	Hazardous Materials	11
29.30.270	Maintenance of Facilities and Equipment	73
29.40 of the City Code	29.40 of the City Code	10
29.50.010	Permits Required	12
29.50.020	Inspections Required	1

Exhibit 1 provides a visual demonstration of the residential housing inspections by geographic location in the Portland metro area for the 2003-2004 fiscal year. With a sustained database, clusters of violations could provide evidence of key problem areas in relation to building code violations. Properties could also be designated by the type of violation to further categorize clusters.

Exhibit 1

Cited Properties by ONI's Neighborhood Inspections Program FY 2003-2004
n=223

Next Steps

To date, the project staff have developed a process to analyze one fiscal year's worth of citations with a specific focus on citations/violations that may have an associated environmental health threat, though general key word search capabilities are readily available for broader searches. This diagram describes the current functionality of the Inspections Database. The database was designed to extract inspection data from MS-Word documents.

Inspection Reports (MS-Word documents)

MS-Access

Open each inspection, extract case information (address, tax id, case number, date, document name) and store in Case data. Identify the text of each violation and the statute(s) cited and store in Violation data.

Case Data

List of Keywords

MS-Access

Go through violation data and search text for keywords, write a record for each record to Keyword data.

Violation Data

Key Word Data

MS-Access

Produce a frequency analysis of statues and keywords.

Statute and Keyword frequency reports

MCHD recognizes the power and usefulness of an enhanced tracking system for ONI and proposes the development and sustainability of a housing inspections database for future housing inspections. This database could provide timely and accurate data for the Office of Neighborhood Involvement, their funders, and the public, with immediately available information such as the number of inspections performed over time, the most common violations, where the predominant housing violations are occurring, which cited properties have paid their violations fee and who is outstanding, total citation revenue and other useful information.

Proposed Housing Inspections Database

The database developed to extract data from the inspection reports could be extended to eliminate the need to write the inspection reports as MS-Word documents. By adding a lookup table of statutes, a screen could be constructed that is similar to the present inspection MS-Word document, but with the advantage of recording violations in a format that can be analyzed and manipulated by reporting or inspection management applications. Functions could easily be added to create inspection and re-inspection schedules and inspection history query screens and reports.

Example Inspection Screen

Description of Proposed Database Operation

Incoming complaints could either be logged in a complaint table, or if the information already exists in the TRACS database, it could be linked (provided TRACS supports ODBC data links) and the inspection generated from the existing complaint information.

Statutes cited can be selected from a pick list. Specific relevant subsections are noted in a separate field, allowing more flexibility for analysis. A unit number within an address can be attached to each violation.

When a statute is selected, the text is copied into the "Violation Text" field. Inspectors can modify the text as required.

Other tracking data could be added to this model, for example, a re-inspection date or information about fines levied, allowing follow-up schedules, reports and analysis.

The main advantage of moving the inspection report function from MS-Word documents to a MS-Access database is the resulting uniformity and immediate availability of the data. For example, an inspector may wish to print an inspection history for an address in preparation for conducting an inspection.

Development Costs

Development of a simple database like the one described would cost approximately $2000-3000. Development tasks would include: Construct main inspection screen, complaint screen or linkage. Create inspection report, inspection and re-inspection schedule, basic quarterly report on inspections performed, statutes violated. Optionally add capability to track fines levied and perform follow-up functions.

Ongoing Support Resources

Ongoing support costs and resources should be minimal. The initial development cost would include installation of the system and creation of links to the TRACS database, if appropriate. Each PC to access the database will need to have MS-Access (2000 or greater) installed. The central data will be on a shared server. The application will use the MS-Access database engine, although SQL server could be used if desired. In that case a SQL database administrator would need to be available for support.

Ongoing annual support for the first year might be $500, decreasing to a few hundred dollars annually. Existing PC support staff should be able to do required support after the first year.

Finding Additional Support Resources

MCHD EH has two financial support options for ONI, should they decide to pursue the database recommendations.

1. If ONI Housing Inspections agrees to maintain a database once developed, MCHD EH will pay for and create the database as described above to suit their needs. Consultation with a database programmer would take place among housing inspectors and management to create the most beneficial and efficient design. A MS-Access training for housing inspectors to learn how to manipulate and create new query screens and reports would also be provided.

2. Should additional funds be necessary to maintain start up efforts, the 2006 notice of funding availability will be released in June 2005 for new applicants from Oregon Department of Human Services' Environmental Public Health Tracking Program. The ONI Housing Inspections database project would be an eligible applicant. Assistance with grant writing and partnership development would be provided to ONI by MCHD EH.

References:

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Questions?

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