

10262 - Methods and Lead and Allergen Results from the First National Environmental Health Survey of Child Care Centers.

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Little has been established previously about the prevalence of environmental hazards in child care centers. HUD, CPSC, and EPA co-sponsored this survey of licensed child care centers nationwide to assess lead-based paint on interior and exterior building components and play equipment, lead, allergens, and pesticides in interior dust, and lead and pesticides in soil. The multistage area probability sample of 10 eligible, licensed child care centers in each of 30 primary sampling units (PSUs) in the continental US ensured sample distribution across geographic regions, representativeness of urban, suburban, and rural areas, and racial and economic distribution. Questionnaire data and lead, allergen, and pesticide samples were collected from 168 child care centers. The discussion will include survey methodology; prevalences of hazardous levels of lead-based paint, dust lead, and soil lead; and prevalences of cockroach and mite allergens above selected concentrations (in units/g and ug/g, of dust). These data will be presented by location within child care centers, as well as by region of the country, building construction year, and economic and ethnic status of the served children.

10288 - Working successfully with an affected community to develop a study to follow-up on findings of dioxin exposure.

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The Calcasieu Estuary area of Louisiana is a heavily industrialized area in Calcasieu Parish that contains a large number of chemical plants that manufacture chlorinated hydrocarbon solvents, vinyl chloride monomer, and petroleum-based chemicals. Previous investigations by the EPA and ATSDR in the community found elevated dioxins levels.

A number of questions were raised by these findings about how representative the elevated levels were for the entire parish and southern Louisiana. Additionally, if dioxin levels are elevated in parish residents, when did exposure occur and what is the source(s) of the exposure? To answer some of these questions, an expanded investigation of biological measures of exposure was designed in partnership with the community and is currently being conducted. Results are due in the spring of 2003.

Citizens of Calcasieu Parish have been involved in environmental activities for many years. They have educated themselves about the effects of the hazardous substances to which they might be exposed. However, for many years they have felt that local, state, and federal environmental and health agencies have not addressed their concerns. As a result, they have become frustrated and suspicious of any government activities in their parish. In developing a study protocol, we were faced with providing a rigorous framework to withstand scientific scrutiny, as well as designing a study which would be accepted by the community. In order to accomplish this, we attended a number of community meetings to hear the concerns of the community, ask questions, and make suggestions. During those meetings we actively sought participants to serve on a Community Work Group to assist in the design of the study. Seventeen community residents representing various community groups decided to serve on the work group. The ATSDR Principal Investigator and investigation team worked collaboratively with the work group to develop the protocol. The work group provided information regarding the geography of the parish, lifestyle, industry, and community perceptions, as well as feedback and recommendations on sampling areas and methods.

This paper will discuss the successful collaboration with the community with special emphasis on developing a community work group to assist in the study design, the advantages of this method of conducting a community investigation, and the difficulties involved in gaining the confidence of a community which does not feel that their concerns are being heard. Emphasis will be placed on educating the community in epidemiologic methods and in being flexible in including recommendations to accommodate the concerns of the community in the design of the study.

### **10336 - Group-level exposure to natural environments and risk of cholera incidence in coastal areas of Colombia, Mexico, and Peru.**

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Residents in coastal territories of Latin American nations are exposed to natural environments that are favourable for survival and multiplication of *Vibrio cholerae* and cholera transmission than natural environments. To the best of our knowledge however, no epidemiological research had been done to date to ascertain the risk of cholera incidence associated to this factor. Ecological double-stratification group-level exposure analyses were done to identify risk of cholera incidence associated to integral and contextual geographical variables that were assumed as proxies for natural environment. MapInfo Geographical Information System was used to mapping incidence rates by departments. In Colombia, over the 1991-1996 period, cholera incidence in the stratum of very poor departments was 12.4 times higher than in the stratum of the least poor departments (95 % C.I.= 11.9-12.9). Incidence was higher in coastal than in interior departments of each poverty stratum, i.e. 26 times higher within the very poor stratum (95 % C.I.=9.8-70.8), 23.8 times within the poor stratum (95 % C.I.=21.5-26), 4.8 times within the rather poor (95 % C.I.=4.6-5.1), and 30.4 times within the least poor (95 % C.I.=26-35.2). In Mexico, over the same period, cholera incidence in the least urban stratum of states was 4 times as high as in the most urbanised stratum (95 C.I.= 3.9-4.1). Incidence was higher in coastal than in interior states of each of the four urban strata, i.e. 2.27 times within the very low urban stratum (95 % C.I.=2.16-2.4), 1.75 times within the low (95 % C.I.=1.7-1.82), 1.16 times within the medium (95 % C.I.=1.1-1.22), and 1.82 times within the highly urbanised stratum (95 % C.I.=1.7-1.92). In Peru, during the 1998 El Niño-driven epidemics, cholera incidence was also higher in coastal than in interior departments, even though poverty is more severe in the latter. Within the stratum of coastal departments, a geographical gradient was found, i.e. higher incidence in the north and lower in the south (chi square of linear trend = 11 866, P= .000001). These ecological, group-level exposure analyses suggest that social variables such as poverty and urbanisation cannot fully explain the higher incidence of cholera in coastal areas of these Latin American nations. Factors of the natural environment -such as water temperature, nutrients, salinity, and pH, plankton, fish and shellfish populations, altitude, rainfalls and floods- that are embodied in the proxy variables of geographic location (coastal/interior, north/south) are also important risk factors and play a significant role in cholera transmission. These contextual variables are not only quite difficult to study in individual-level exposure analysis, but also too expensive to measure or quantify, particularly in developing nations. It is concluded that poor communities residing in coastal areas should be prioritised when it comes to investing in safe water supply facilities, adequate excreta disposal systems, surveillance of *Vibrio cholerae* in the environment, and active search of cholera cases. Moreover, ecological group-level exposure analyses should not be neglected as they proves useful to measure risk associated to integral and contextual variables.

## **10684 - PUBLIC HEALTH CHALLENGES OF MONITORING ENVIRONMENTAL LEAD AND RELATED CHEMICAL EXPOSURES IN RURAL AND REMOTE SETTINGS.**

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As a public health concern, chronic exposure to low levels of lead has continued to stimulate interest in developed and developing countries. Prevention approaches require proper ascertainment and characterization of exposures, risk characterization, health effects determination, and the implementation of appropriate prevention strategies.

At the primary lead ore smelter in Port Pirie, South Australia, recent analysis employing the use of optical microscopy and X-ray diffraction techniques have identified a complex mixture of PbS, ZnS, ZnO, associated with one or more of Cl bearing phases Pb(OH)Cl, PbCl<sub>2</sub>, Na<sub>3</sub>Pb<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>Cl, Pb<sub>4</sub>O<sub>3</sub>Cl<sub>2</sub>, Pb<sub>10</sub>(SO<sub>4</sub>)Cl<sub>2</sub>O<sub>8</sub>, Pb<sub>7</sub>S<sub>2</sub>Cl<sub>10</sub>, Pb<sub>4</sub>S<sub>2</sub>Cl<sub>6</sub>. Arsenic Trioxide (As<sub>2</sub>O<sub>3</sub>) has also been detected in the fugitive emissions.

Multiple particle releases place a burden on monitoring for exposures and health effects over time, especially in terms of choosing which particles to monitor, thresholds for adverse effect on morbidity, potential for multiple chemical toxicity in exposure-effect characterizations, which affect morbidity and mortality.

Several communities with point sources of emission develop a close relationship with and identify with economic aspirations of community industrial plants. As new information becomes available regarding exposures over time, communication of these in such communities could present challenges in public health as the interventions may interfere with or even threaten community economic potentials and their viability.

This presentation would explore important public health issues under the following three main headings; a) Epidemiological perspectives to address the issues raised above

b) Community expectations, fears and concerns and c) Public health advocacy in the context of a rural and remote community.

## **Environmentally-related Disease Clusters in The Netherlands**

Regularly, Area Health Authorities (GGD) are presented with reports of raised and suspected prevalence or incidence of diseases (disease clusters). Typically, these clusters are attributed to the state of the environment. In this study an inventory of environmentally-related disease clusters reported to GGD's in The Netherlands is presented. Main aim was to assess the number and type, and the extent of the disease clusters (people, time and, place).

Information on reported clusters was collected by means of a written questionnaire sent to civil servants at all of the 54 GGDs in The Netherlands. Disease clusters were inventoried over a five-year period (1993 - 1997). Thirty-five GGD's (65%) participated in the study.

120 clusters were reported over a five-year period. On average, this is less than one cluster per GGD per year. The majority of the reported clusters (73%) concerned morbidity or mortality due to cancer. The source most frequently associated with a disease cluster is soil pollution

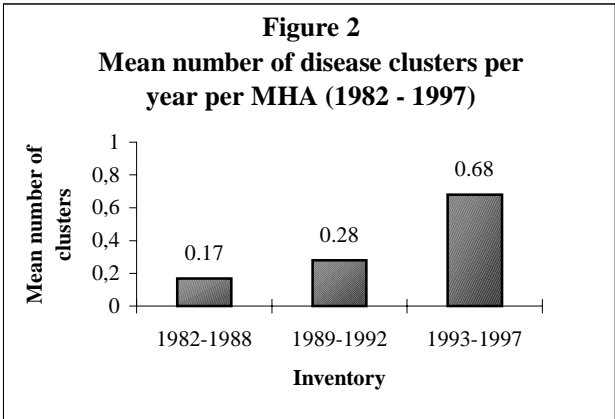
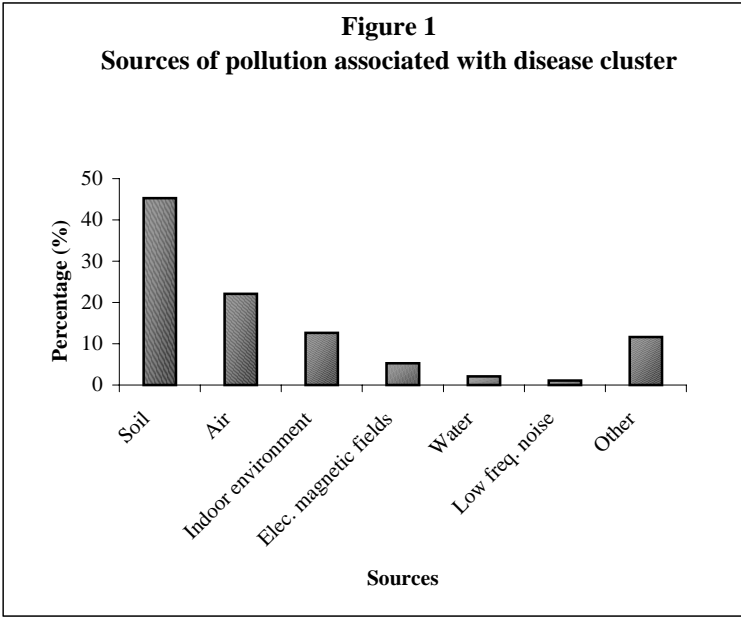
(Figure 1).

The mean number of people involved was 17 persons per cluster (median: 10). In most cases (74%) no specific subgroups (e.g., children, elderly) were involved. Typically, disorders were observed over a long period of time (years). Most of the clusters (80%) were observed at the neighbourhood level or lower. The prevalence of cluster signals is more than one (1.36) per 100,000 inhabitants per 5 year. None of the reported disease clusters was confirmed in a case-control study.

Over the past 15 years the number of cluster reports has increased almost 4-fold

(Figure 2).

Although not studied, but taken into account that none of the clusters had been confirmed, *concern* about the quality of the living environment in relation to possible health effects seems to be an important motive to report a disease cluster. The observed increase in reported, alleged, disease clusters over the past years justifies monitoring these signals.



11070 - Utilizing community-based participatory research methods in an epidemiological investigation of autoimmune disease

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In response to community concern regarding a possible cluster of autoimmune disease and its suspect relation to toxic sites located within the area, the Department of Social and Preventive Medicine of the University of Buffalo has partnered with community members to conduct community-based participatory research. The target area on Buffalo's east side is composed of approximately 11,000 people, primarily of African-American descent. The estimated crude prevalence rate of systemic lupus erythematosus (SLE) among women is 200 per 100,000. The first stage of the project is currently underway, with the expectation of meeting the objectives of 1) inventorying waste sites and point sources of pollution and documenting potential exposure pathways, 2) evaluating the identified cluster of SLE in the target population, 3) the modification of the autoimmune disease registry to meet the needs and concerns of community partners and 4) developing and implementing community education about autoimmune disease and the registry. Our community-based participatory research methods will be highlighted, which allow community members to be directly involved in epidemiologic research, including study design, survey methods, intervention and prevention, and acting as liaisons between the community and researchers. The open communication involved in the process is an invaluable tool, allowing for effective communication when dealing with cultural barriers, lack of trust, and other sensitive issues and will ultimately result in a strengthened relationship between the community and the university. The research process and the attention garnered will provide the community with the resources to procure additional funding to clean up toxic sites, an opportunity to improve the health care needs of the community, and the framework on which to build future research projects.

## **11130 - The Effect of Sampling Duration on Average Contaminant Concentrations in Personal Exposure Studies**

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The Alberta Oil Sands Community Exposure and Health Effects Assessment Program (1996), the Grande Prairie and Area Community Exposure and Health Effects Assessment Program (2000), and the Fort Saskatchewan and Area Community Exposure and Health Effects Assessment Program (2001) were large-scale studies designed to assess potential links between air quality and human health. In these studies, a personal exposure assessment methodology was applied to a sample of more than 500 participants. The key component of the study design was the measures of exposure to air contaminants of concern including nitrogen dioxide, sulphur dioxide, ozone, volatile organic compounds, and particulate matter. The design also incorporated measures of indoor, outdoor and ambient contaminant levels to support the comparison of personal exposure measures and to evaluate the utility of ambient measures as a proxy for human exposure.

The study designs of the personal, indoor, outdoor, and ambient air sampling components were identical except for the sampling duration period. In one study protocol, four consecutive 24-hour samples were collected. The sampling period for subsequent studies was modified to one continuous, 7-day sample. The 7-day sample provided a more representative integrated exposure measure. However, the 7-day sampling period may have sacrificed some of the variability relating to time activity patterns.

The selection of passive sampling duration depends on the study objectives and contaminant concentrations expected. The minimum useful duration is a function of sampler detection limit and concentrations expected. This minimum duration may not support some study objectives relating time activity diary patterns to exposure.