**Introduction**

Diabetes mellitus is a heterogeneous group of disorders characterized by altered glucose metabolism and resulting in high blood glucose levels. Diabetes is classified into two main types:

1) Type 1 diabetes that requires the use of insulin, and
2) Type 2 diabetes that usually has a later age at onset and can often be managed through diet and physical activity alone.

According to the 2000 Behavioral Risk Factor Survey, the proportion of Michigan residents who report having diabetes has increased 25 percent since the early 1990s. Furthermore, many more people are affected by this illness than are aware of it. Without adequate control of blood glucose either through use of insulin or attention to diet and physical activity, there is a much greater risk of developing severe complications including blindness, kidney damage, nerve damage, and coronary heart disease. The average annual health care cost for a person with diabetes was $10,071 in 1997.

Younger people are increasingly being diagnosed with type 2 diabetes. Among people aged 30-39, there was a 76 percent increase in prevalence between 1990-1998. Adolescents represent another group with rising rates of type 2 diabetes. The scope of this problem cannot be overestimated. Youth with type 2 diabetes will be living with this illness for most of their lives and may exhibit earlier onset of its devastating and costly complications.

A simple model for the progression to diabetes is illustrated in Figure 1 on page 2. Potentially modifiable risk factors for type 2 diabetes include physical inactivity and obesity (step 1). A subset of people with these risk factors will progress to impaired glucose tolerance (IGT), a condition characterized by increased blood glucose that has not reached the threshold of overt diabetes mellitus (step 2). Some people with IGT will progress to diabetes mellitus (step 3), and a proportion of them will develop diabetes-related complications (step 4).

The public health community currently finds itself at a crossroads with respect to the prevention and control of type 2 diabetes mellitus. Current prevention activities are focused on improving standards of care to prevent complications among people with already diagnosed diabetes. A recent Finnish study demonstrated a 58 percent reduction in the risk of type 2 diabetes among a group of middle-aged and overweight people with IGT (see http://www.cdc.gov/diabetes/news/finnish.htm). The intervention involved intensive lifestyle changes and support, including individually tailored dietary advice on how to decrease fat intake and increase fiber intake. Supervised physical fitness training was also individually tailored with the purpose of increasing strength and cardiovascular fitness. What does this study suggest about the possibility of implementing diabetes primary prevention programs?

**Public Health Intervention**

Currently, government-sponsored public health programs are primarily focused on the secondary prevention of diabetes complications (step 4) through improving diabetes-related care. Example programs include: 1) Michigan’s six diabetes outreach networks whose aims include enhancing quality diabetes care through public and health provider education and maintaining a system to track patient care (see http://www.michigan.gov/PH/ DIABETES/don97rv1.htm), and 2) a national public awareness campaign that

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stresses the importance of glucose control (see http://ndep.nih.gov/).

The evidence from the Finnish study opens the possibility of extending prevention programs to people with IGT (step 3). Finding sufficient resources, however, to provide the intensive dietary or physical fitness intervention described in the recent study to all individuals with IGT is unlikely, and the long-term benefit of such an approach remains uncertain. It may ultimately be more effective to intervene earlier in the progression to diabetes to decrease risk factors for IGT across the entire population. This possibility raises many questions. For example, can the public health community design effective interventions for people at risk for IGT (step 2) or for people with a healthy risk profile to prevent them from developing an unhealthy one (step 1)?

With interventions tailored to their participants, the Finnish researchers' approach emphasized the individual. Interventions designed to incorporate the roles of families and the organization of communities might have greater impact for all individuals regardless of their level of risk. Questions needing answers include: would promoting physical activity for entire families increase life-long habits, and are there modifications to the community infrastructure that would make healthy diets or physical activities more sustainable?

**Future direction**

Reducing the number of people with diabetes will certainly be a formidable task. Without efforts to encompass primary diabetes prevention, we are likely to find ourselves in diabetes gridlock with more and more people requiring care and fewer resources allocated per person with diabetes. Effective diabetes prevention will likely depend on expanding the scope of intervention to encompass earlier phases of the natural history of diabetes as well as expanding efforts to include family and community wellness. Successful community-level intervention to promote physical activity and healthy lifestyles will depend on creative partnerships. Can coalitions be built to provide a bridge between private and public sectors? What can be the role of boards of education, or parks and recreation, urban planning, or transportation departments? With new studies demonstrating the feasibility of decreasing diabetes risk, the imperative is to convert this knowledge into improvements in the public’s health.

Through a collaborative arrangement between the Bureau of Epidemiology and the Diabetes, Dementia, and Kidney Section, a diabetes epidemiology position was created to address diabetes-related issues in Michigan. In addition to the design of studies to build support for prevention activities, other activities include surveillance of diabetes risk factors, and evaluation of new programs. For more information, contact Kathy Bainbridge, Diabetes Epidemiologist, at 517-335-8226 or BainbridgeK@state.mi.us.

**West Nile Virus Surveillance**

The WNV Hotline, 1-888-668-0869, is up and running. Information can also be obtained on the web at www.mda.state.mi.us/consumer/westnilevirus. Telephone calls regarding dead crow sightings and/or collections should be forwarded to this number. In addition, acute encephalitis human cases with an unknown etiology should be immediately reported to the Communicable Disease and Immunization Division at (517)335-8165.
A fundamental role of the United States public health system is to minimize mortality and morbidity associated with disease. The threat of bioterrorism, newly emerging and re-emerging infectious diseases, impending pandemic influenza and outbreaks of all types of illness illustrate the importance of that role. Public health response to these events must be timely to be effective. A robust network of emergency contacts helps to ensure that timeliness. Staff at the MDCH have attempted to develop a contact system within the public health community, taking advantage of existing resources.

During March 2001, Surveillance Systems Section staff conducted an assessment of the Local Public Health Emergency Notification System via broadcast fax, email and after-hours contact.

As is evidenced in the table, some means of communication have been demonstrated to be more effective than others. With email, the over-all response rate was a disappointing 51%, with a median time for reply of over five hours. While this may be adequate for much of our traditional agency communications, it would seem excessively long for the time-critical, emergent disease events that this system has been designed to address. In contrast, the use of broadcast fax in mass notification appears to be effective during normal working hours. The median time of reply for 90% of the jurisdictions was well less than half that of the email times.

The after-hours telephone communication system was an effective (>80%) means of generating an individual contact’s timely (<10 minutes) response. The impediment to using this system for contacting local jurisdiction’s ability to receive critical information is most obviously enhanced by the provision of multiple contacts and multiple communication modalities. Future system tests will be used to reinforce the necessity of emergency contact accessibility and verify system information.

The test demonstrated the value of redundancy in any communication system. A local health jurisdiction’s ability to receive critical information is most obviously enhanced by the provision of multiple contacts and multiple communication modalities. Future system tests will be used to reinforce the necessity of emergency contact accessibility and verify system information.

The Division of Communicable Disease and Immunization has recently begun enhancing meningitis surveillance in order to better characterize the epidemiology of Neisseria meningitidis in Michigan, especially in light of a cluster of meningitis cases that occurred in southeastern Michigan in 2000. As part of this surveillance effort, we have requested local health departments (LHDs) to immediately notify MDCH of any case of meningitis. Furthermore, we have asked that LHDs make a special effort to collect information on the species and the serogroup of the organism, and the outcome of the case. If all of this information is not available when the case is first reported to MDCH, LHDs may update records through the electronic reporting system, LHDSURV, as the information becomes available. MDCH will also follow up on cases reported with incomplete information. For cases of meningococcal disease, we have released a new supplemental form to obtain information on increased risk. The information requested on this new supplemental form cannot be entered into LHDSURV and should be mailed to the MDCH Communicable Disease & Immunization Division.

MDCH encourages physicians and infection control practitioners to continue to report meningitis cases to their LHD as soon as possible after diagnosis. Laboratories are requested to forward any isolate of meningitis-causing organism to the MDCH laboratory in Lansing for serogrouping and PFGE molecular characterization. This remains our best method for determining whether or not cases of meningitis are related. If you have any questions or comments, please call Mark Schmidt at (517) 335-8165.
The 2000 rabies season was a busy year for testing at the MDCH laboratory. A record number of specimens (2,983) were examined for the presence of rabies virus, with bats taking over as the primary species of animal tested. Table 1 is a summary of specimens tested over the past five years and shows a steady increase in the number of specimens tested, as well as a transition from cats to bats as the primary specimen (as a percentage of the total tested).

In 1997, the CDC first proposed a change in their recommendations as to what constitutes an exposure to a bat. In 1999, these recommendations were fully implemented and described a bat exposure as not only a bite or scratch from a bat, but also finding a live or dead bat in living quarters where it had access to sleeping persons, young children, or mentally incapacitated or intoxicated individuals. The loosening of the definition of a bat exposure was initiated because of concerns that a bat bite might not be obvious to the victim, and that some persons might not be able to verbalize such an incident. The effect of the new criteria has been an increase over time in the number of bats submitted for testing. Although there has been a concomitant increase in the absolute number of rabies-positive bats, the rate of positivity among all specimens tested (Table 2) has remained relatively stable — the recent exception being 1999 during which an increase in the number of rabies-positive skunks was observed.

The year 2000 in Michigan was also marked by some unusual rabies occurrences; several rabid red foxes were identified on Mackinac Island. At the end of October, a red fox that had been observed exhibiting signs of rabies (acting ill, drooling, difficulty maintaining balance) was found dead by the island park commission. The animal was submitted for rabies testing at the MDCH laboratory and found to be positive for rabies virus. At about the time that the results of the first fox were made available, a second red fox was found dead on the island. This animal was also submitted for testing and was determined to be rabies-positive.

Subsequent to these results being communicated throughout the island, reports of five additional sick foxes that had died were made to the island park commission. Unfortunately, none of these animals were available for testing. In addition, there were reports of other foxes that had been observed during the summer exhibiting a lack of fear of humans. Other individuals stated they had noticed dead animal smells while hiking but had been unable to locate any carcasses. It is not clear how the foxes acquired the virus. Rabies-positive foxes were reported in early in 2000 in Ontario, Canada, north of Sault St. Marie. There has been speculation that infected foxes crossed Lake Huron from Ontario to the island while the lake was still frozen and spread the virus to the fox population on the island. Efforts are currently underway at both the MDCH and CDC rabies laboratories to determine the strain of rabies virus with which the Mackinac Island foxes were infected.

Any rabies-related questions can be directed to Duane Newton at (517) 335-8067 or Mary Grace Stobierski at (517) 335-8165.
Formaldehyde gas irritates eyes and mucous membranes of the upper respiratory tract, and repeated inhalation even at low levels causes respiratory and ocular problems in sensitized persons. These effects include eye irritation, dry and sore throat, runny and/or bloody nose, cough, sinus irritation and infection, headache, fatigue, depression, difficulty sleeping, abdominal and chest pains, and possibly diarrhea (1-3). Reported concentrations of formaldehyde in some Michigan indoor air environments range from 60-100 ppb, levels at which respiratory and ocular problems can occur in sensitized persons.

Formaldehyde has shown a positive mutagenic response in several test systems. Sufficient data indicate that formaldehyde results in increased incidence of cancer in experimental animals. The U.S. Environmental Protection Agency (U.S. EPA) has classified formaldehyde as a Group B1 probable human carcinogen based on limited evidence of carcinogenicity from epidemiological studies, however, new U.S. EPA guidelines will classify it in the “known/likely” category.

The Michigan Occupational Health Laboratory is able to analyze air samples for formaldehyde. The Division of Environmental and Occupational Epidemiology in the Bureau of Epidemiology can assist state residents in getting indoor air samples analyzed for formaldehyde.

References

The Centers for Disease Control National Pharmaceutical Stockpile (NPS) Program has developed a national repository of life-saving pharmaceuticals and medical materiel which can be delivered to the site of a chemical or biological terrorism event in order to help reduce mortality and morbidity in the civilian population. Various tabletop and functional exercises (TOPOF, April 2000) suggest that many local response authorities are unprepared to make maximum effective use of NPS materiel. The Michigan Department of Community Health, in collaboration with the Michigan State Police Emergency Management Division, will be taking the lead for developing a plan to effectively use these materiel. Planning will be two-tiered; a plan will first be developed for receiving supplies at selected airports throughout Michigan and then for receiving the supplies within the community public health system. We are currently in the process of developing two pilot plans for the receipt and distribution of the NPS by the Tri-County Medical Control Authority, which serves Ingham, Clinton, and Eaton counties. Development of these pilot plans is being coordinated with public health departments, emergency management, emergency medical services, hospitals, public safety officials, and airport authorities. Upon completion of these pilots, we will have developed templates to guide additional planning efforts throughout Michigan. If you have any further questions, please contact Karen MacMaster at (517) 335-8165 or by email at macmasterk@state.mi.us.
A PhD nutritionist by training, Cassius Lockett joined the Epidemic Intelligence Service in 1999. During the past two years, he has participated in a wide variety of field and analytic investigations. He began with a rotavirus vaccine investigation that lasted six weeks. Analysis of data from Michigan, in conjunction with evidence from other states, demonstrated that Rotashield vaccine was strongly associated with intussusception and is now no longer recommended for infants in the United States.

Lockett led several analytic investigations with important implications for improving maternal and child health programs. One investigation involved using data from the Behavioral Risk Factor Survey to investigate folic acid knowledge and supplementation among Michigan women of reproductive age. From this analysis, Lockett developed recommendations to improve targeting of public education campaigns that promote folic acid use. Lockett also evaluated Michigan’s Maternal Mortality Study. An important outcome of this investigation was the addition of a non-medical expert review panel to the study consisting of social workers, experts in traffic safety, and others.

Recently, he accepted an appointment with the California Department of Health Services, Children’s Medical Services (CMS) as a research scientist. Michigan and the Bureau owe Lockett a great deal and we wish him the best in his new endeavor.

Melinda Wilkins Completes EIS Training

Melinda Wilkins, D.V.M., M.P.H., is completing her two-year Epidemic Intelligence Service (EIS) training experience with the Bureau of Epidemiology. She has made several notable contributions to public health in Michigan during her EIS experience. She played a key role in the 1999-2000 statewide Salmonella Infantis outbreak, which was linked to backyard poultry flocks, and conducted a thorough study of the impact of arsenic in drinking water (< 50 ppb) on birth outcomes. In addition to these epidemiologic investigations, she also participated in a three-month project in northern India working with the World Health Organization Polio Eradication Program and a one-month effort in England working on foot and mouth disease elimination.

Wilkins will remain stationed at the Bureau of Epidemiology for the next several years as a U.S. Department of Agriculture assignee working with the bovine tuberculosis control program. She has also been accepted into a doctoral program at the Michigan State University, College of Veterinary Medicine. Please join us in congratulating Wilkins both on her accomplishments over the past two years and on her new appointments.

Epidemiologist Passed Away

Shawn Abyss, HIV Epidemiologist of our Detroit-based HIV/AIDS Surveillance program, passed away Thursday, August 2, 2001. He graduated from Morehouse College, cum laude, with a BS in Psychology and Biology and continued his education to become a graduate of the University of Michigan School of Public Health. Shawn came to MDCH eight years ago as a data manager for the HIV Serosurveillance program. He managed the data for the sero-surveys, Survey of Childbearing Women and Sero-incidence studies. There are not enough accolades to describe Shawn Abyss. In addition to being a excellent employee, Shawn was a wonderful and kind person who would always go the extra mile to assist someone in need. His absence will be a great loss for MDCH and for all of those who knew him.

Norm Keon Retires

Mr. Norm Keon has retired after 29 years with the department. He was the lead for the Tuberculosis Control Program within the state, as well as conducting accreditation reviews of the communicable disease programs. Keon had been involved in many local health department programs, including the LHDSURV which is an electronic surveillance and reporting tool used by almost all local health departments for tracking and reporting the reportable communicable diseases in Michigan. Keon has recently taken a joint position as an epidemiologist with the Central Michigan District and Mid-Michigan District health departments.

We all wish Mr. Keon success and satisfaction in his new pursuits.

Conferences

American Public Health Association 129th Annual Meeting — One World: Global Health October 21-25, 2001 — Atlanta, Georgia Come explore a world of ideas and innovation with more than 12,000 of your peers and leaders in public health.

North Central States Epidemiology Conference hosted by Nebraska October 4-5, 2001 Chicago, Illinois Contact Dennis Leschinsky for more information at dennis.leschinsky@hhss.state.ne.us

Mercury Spills Conference October 23, 2001 9:00am-1:30pm Contact Tom Dewhirst at tmdhew@kalcounty.com

Annual MDCH/MIDS Meeting November 8, 2001 Botsford Hospital Farmington Hills, Michigan
Employee Focus: Linda Larsen

December brought more than Christmas presents for the Toxicology and Response Section (TRS); Linda Larsen joined us from the Michigan Department of Environmental Quality (MDEQ), Environmental Response Division, where she had supported their efforts as an environmental toxicologist for seven years. While there, Linda developed sections of the administrative rules and MDEQ policies for the Michigan Act 451, Part 201 environmental cleanup program and interpreted federal environmental laws, rules, and policies related to the same. She also developed risk assessment methodologies and guidance for the implementation of Part 201, reviewed and conducted risk assessments for Superfund sites, and developed health based cleanup criteria for chemicals for Michigan.

Prior to the MDEQ position Linda worked in a contract laboratory, and, among other responsibilities, studied the behavioral effects of cancer therapy on laboratory animals. While a graduate student at MSU, she managed and supervised graduate students to study plastics recycling. The project collected information and assembled a database on the recycling process and the effects of plastics on human health and the environment.

Larson has a Ph.D. from MSU in dual disciplines, Toxicology and Environmental Policy and Law, but she can talk to you as knowledgeably about her garden and its vegetation, both edible and decorative. She is originally from Muskegon but has made East Lansing her home since 1987. She lives a quiet life punctuated by home remodeling and voracious reading, with her husband, three children, and a variety of animals.

She was attracted to MDCH by the opportunity to protect people’s health from a different angle. Although it is early in her tenure, Larson is already completely immersed in the great variety of requests for environmental health investigations, evaluations, and opinions. She is also busy crafting the grant application for the Agency for Toxic Substances and Disease Registry cooperative agreement, which funds all the staff in the section.

Her sense of humor and attention to detail are her strongest resources as she seeks to establish an atoll of applied environmental health in a sea of epidemiologists. Though diminutive in stature, she is large on experience in the more complicated and controversial environmental issues, like Dioxin, that have been part of Michigan’s environmental landscape.

Whether you encounter her in her office or while she is power-walking in the parking lot getting ready for an upcoming Isle Royal trek, stop to meet one of the latest team players to join MDCH.

New Employees

Wilma McGee joined the Detroit office of the HIV/AIDS Surveillance Section as an HIV/AIDS Surveillance Associate. McGee has many years of nursing experience as well as three years of data abstraction experience. She previously worked as a Data Abstractor for one of our surveillance studies.

Elizabeth Eby, MPH, joined the Division of Epidemiology Services as an epidemiologist. Her primary responsibility is to analyze and publish data from the Pregnancy Risk Assessment Monitoring System (PRAMS) and to provide epidemiologic consultation to the Women, Infants, and Children (WIC) program. Eby is from Jackson, received a bachelor’s degree from Alma College, and has recently completed an MPH at the University of Michigan.

Lisa Jacques, MSW, joined the Communicable Disease and Immunization Division as a vaccine specialist with the Immunization Program on the Vaccine for Children Program. She will be assisting the VFC coordinator with vaccine management activities, data analysis, and management of the VFC program. Prior to coming to MDCH, Jacques served in a field placement at DeVos Children Hospital. She is a recent graduate of MSU’s MSW Program.

Tom Largo, MPH, is the new injury epidemiologist in the Division of Environmental and Occupational Epidemiology. He will be working on developing a surveillance system of occupational illness and injury. In his previous position, Tom was the epidemiologist for the Violence Prevention Section responsible for developing a surveillance system for intimate partner violence. His BS degree is in mechanical engineering from the University of Michigan and his MPH is from Johns Hopkins University.

Sarah Reagan, MPH, is a new STD Epidemiologist in the Division of Communicable Disease and Immunization, HIV/STD/Blood borne Infections Section, at the Detroit office. Reagan did her undergraduate work in anthropology at Southern Illinois University and her MPH from the University of Michigan. Previously she was an epidemiologist in the TB Control Program in the New York City Health Department.

Darcy Wildt is a new secretary in the Division of Communicable Disease and Immunization. Wildt is a lifelong resident of Michigan and has most recently worked in the non-profit sector with domestic violence victims and on affordable housing issues.

Dianne Herbin is with the Division of Communicable Disease and Immunization. Herbin provides secretarial support to the immunization record assessment (CASA/AFIX) staff. Dianne comes to us from the MDCH Lead Abatement program with many years of secretarial experience.

In addition to new employees, we have University of Michigan Epidemiology graduate students:

Alison Burch: HIV/AIDS surveillance
Carla Merritt: Immunizations
Melissa Frye: STD epidemiology
Michelle Packard: Lab/Enteric epidemiology
Kevin McConis: Asthma surveillance
2001 First Michigan Communicable Disease Conference

We would like to thank those of you who attended the 2001 First Michigan Communicable Disease Conference, which was held in East Lansing. The purpose of this conference was to provide an overview of communicable disease reporting, surveillance, and disease updates, and to make available resources that may assist public health professionals working with communicable diseases in Michigan. Over 120 public health nurses, epidemiologists, and medical directors attended. We were pleased by the attendance and how well the conference went, although its success can only truly be measured by how useful the information provided turns out to be for those who attended. We would be very interested in any suggestions that you may have for how this conference may be improved in the future. Please contact Sonja Hrabowy or Mark Schmidt at (517) 335-8165 with your suggestions. We look forward to hosting two regional communicable disease conferences in 2002.

Department of Justice Public Health Assessment Update

We have completed the data collection process for assessing the capabilities of local public health systems to respond to public health emergencies. Forty-four local health departments participated in this assessment. These data are being forwarded to CDC, where they will be compiled as part of a nationwide assessment of local public health capabilities. We are in the process of analyzing the Michigan assessment data, and upon completion of our analysis, we will provide each health department with a copy of this statewide analysis. The expected completion date is September 2001. We would like to thank all health departments that participated in this assessment process. We believe the assessment will provide valuable information for programs from a variety of local and state public health activities. If you have any further questions, please contact Karen MacMaster at (517) 335-8165 or by email at macmasterk@state.mi.us.