



The Great Lakes EpiCenter News

Epidemiology Project of the Great Lakes Inter-Tribal Council, Inc.

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Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations and the application of this study to the control of health problems.

The EpiCenter provides epidemiological services to the Tribes in the Bemidji Area (Michigan, Wisconsin, and Minnesota). The services include training and technical assistance in many areas of public health, data management, program planning, and program evaluation.

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2004 Community Health Profiles Michigan, Minnesota and Wisconsin an Overview

The Epicenter recently published our annual report entitled, 'Community Health Profile: Michigan, Minnesota, and Wisconsin Tribal Communities, 2004'. The Profile contains information at the state-level for each of the aforementioned states, in addition to three-state level data for the collective Bemidji area (MI, MN, and WI).

The Community Health Profile provides a snapshot of the health of American Indian/Alaska Native people in the Bemidji Indian Health Service Area. The Profile includes information pertaining to demographics, mortality, diabetes, communicable diseases, and maternal & child health. Data sources for this Community Health Profile include: U.S. Census Bureau, Michigan Department of Community Health, Minnesota Department of Health, Wisconsin Department of Health & Family Services, state Women, Infants and Children (WIC) Programs, Centers for Disease Control & Prevention (CDC), Tribal Health Centers, Indian Health Service (IHS), National Center for Health Statistics, and U.S. Department of Health & Human Services.

Select key findings from this year's profile are presented in tables (1 & 2) and graphs (1-3). Data presented cover categories as diverse as smoking during pregnancy, leading cause of death, and proportions of obesity and overweight.

TABLE 1 - Births to Mothers Who Smoked During Pregnancy, by Percent, 2000-2002

AI/AN Michigan	32.8	All Races Michigan	15.3
AI/AN Minnesota	36.6	All Races Minnesota	10.9
AI/AN Wisconsin	34.2 [^]	All Races Wisconsin	15.7 ^{^^}
AI/AN Bemidji Area	34.7	All Races Bemidji Area	14.4
IHS Total	20.2 [*]	All Races U.S.	12.0 ^{**}
HP 2010	-		

Data Sources: 2000-2002 Birth and Death Files from Michigan Department of Community Health, Minnesota Center for Health Statistics, and Wisconsin Bureau of Health Information

^{*}Data from Trends in Indian Health, IHS, 2000-2001 (1996-1998 data)

^{**}National Center for Health Statistics, 2001

[^]2000-2002 Birth Files, Wisconsin Department of Health and Human Services

^{^^}WISH Data Query System (Wisconsin Interactive Statistics on Health)

TABLE 2- Leading Causes of Death for American Indian/Alaska Natives in Bemidji Area, 2000-2002

Cause of Death	2002		2001		2000	
	#	%	#	%	#	%
1. Heart Disease	225	21.8	260	23.9	222	22.7
<i>Ischemic Heart Disease</i>	173	76.9	183	70.4	164	73.9
2. Cancer	165	15.9	212	19.5	181	18.5
<i>Lung Cancer</i>	42	25.5	81	38.2	54	29.8
3. Unintentional Injury	107	10.4	119	10.9	101	10.3
<i>Motor Vehicle Accidents</i>	33	30.8	72	60.5	57	56.4
5. Diabetes	67	6.5	56	5.2	63	6.4
4. Chronic Lower Resp. Disease	65	6.3	52	6.1	51	5.2
Sub-total	629	60.9	714	65.8	618	63.2
TOTAL DEATHS	1032	100.0	1085	100.0	978	100.0

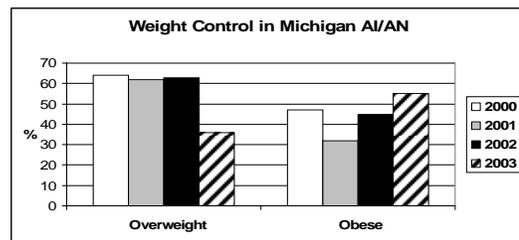
Sources: 2000-2002 Mortality Files from Michigan Department of Community Health, Minnesota Center for Health Statistics, and Wisconsin Bureau of Health Information

In summary, highlights from the 2004 Profile include:

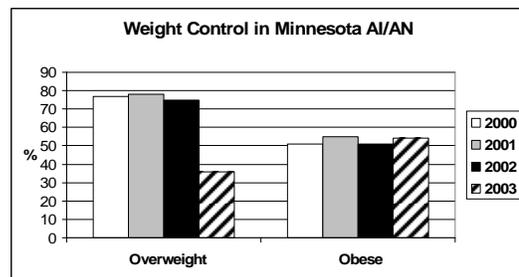
- The Bemidji Area the proportion of AI/AN as a percent of the total population has remained fairly stable from 1990 to 2002, ranging between 0.8% and 0.9%.
- It is estimated that nearly half of the Bemidji Area AI/AN population (46.2%) are under 25 years of age.
- Male AI/AN-headed households increased in each state from 1990 to 2000.
- Heart disease remains the highest cause of death for American Indian/Alaskan Native in the Bemidji Area. (Table 2)
- The overall trends of obesity (Graphs 1-3) have increased for people diagnosed with diabetes in the states of Minnesota, Michigan, and Wisconsin.
- The IMR for the Bemidji Area AI/AN in 2000-2002 was 8.9 deaths per 1,000 live births; as compared to 7.1 per 1,000 live births for All Races in the Bemidji area.
- The low birth weight rates were lower for AI/AN Bemidji Area babies (6.7%) than for All Races in the Bemidji Area (7.2%).
- 34.7% of Bemidji Area AI/AN babies were born to mothers who smoked during pregnancy. (Table 1)

Copies of the 2004 Community Health Profile, as well as past years' Profiles, can be obtained in their entirety on Great Lakes Epicenter's website with the following link:
<http://www.qlic.org/epicenter/publications.html>, or by contacting Jean Koranda either via phone at (715) 588-3324 ext. 162, or via email: ikoranda@qlic.org.

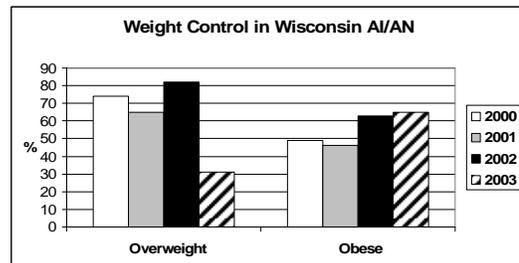
Graph 1



Graph 2



Graph 3



BioTerrorism, Emergency Preparedness and Tribal Health Centers

Submitted by Nitin Bagul

Twenty-two cases of Anthrax following the terrible 9/11 attacks, the fear that the unthinkable can now happen, and alarms that deadly weapons like small pox might be in evil hands; these very concerns of bioterrorism compelled the Government to grant more awards and require the Local and Tribal Public Health Departments to mobilize and prepare for potential bioterrorism attacks. To date, the State of Wisconsin has awarded 38 million dollars, 20 and 18 million dollars for the past two years respectively, to bring the disciplines of social and community health into the military campaign of emergency preparedness and one of the leading agencies in national defense.

At such times when Tribal Health Departments have priorities to control chronic conditions, are experiencing financial challenges due to inadequate funding, and where qualified personnel are limited, people are asking questions: Do we really need to prepare for such unseen threats like an anthrax bombing? Is a bioterrorist attack really going to happen in rural and Tribal areas of Wisconsin? Why can't we just spend the money on other prevention efforts rather than on drills for small pox vaccination?

The concerns expressed by many of the public health professionals are not unjustified. At the very beginning of preparedness activities, the fear was that the new focus on bioterrorism would distort public health priorities, narrow the scope of activities and that the preparedness exercises might undermine the broader mission of public health. These concerns are a result of public health being a silent partner over the years, and thus often left in the background of activism as a result. This is the first instance in modern times that public health is in the national spotlight and is being recognized as an important pillar of the community; capable of providing a secure and healthy environment. Assuringly, these are the very same roles public health demonstrated during the deadly outbreaks at the beginning of the century, providing the lead to the community to fight vicious and often deadly diseases like plague and yellow fever.

The public health preparedness/bioterrorism grants awarded by the State of Wisconsin are essentially infrastructure grants based on the evolutionary results in the aftermath of 9/11. It

was realized that public health is not well-enough equipped with surveillance, disease control capacities or advanced technology. The amount of funding for bioterrorism will not affect current Tribal or local priorities, but is in addition to any other grants that are currently in place. The preparedness grants are aimed at building a better infrastructure in terms of surveillance and analytical capacities. These capacities will not just have an effect on communicable diseases, but will have a positive impact on chronic conditions. The personnel at Tribal Health Centers /Local Public Health Departments are being trained to utilize a vast network of information resources, use up-to-date communication/digital technologies, and respond more appropriately in media/relations and communication activities.

Mass immunization clinic drills exercise the capability of public health professionals to provide services to the population in a very short period of time. These drills help staff identify their department's strengths and weaknesses. These exercises not only apply to bioterrorism events, but can also help in routine situations like flu clinics or outbreaks by providing expert and prepared staff. In addition to building the basic infrastructure, the capabilities in disease diagnosis and laboratory analysis are also being enhanced. Many of the laboratories are now capable of providing advanced tests locally. Some of the Tribes now have access to statewide lab reporting and can be cognizant of what is occurring around the state.

In the two years of the GLITC Wisconsin bioterrorism grant, we have seen enhanced relationships between Tribes and Counties. The local and regional partnerships are being formed to foster the judicious use of resources and share knowledge. The partnerships include Tribal and Local Health Departments, law enforcement, and health care providers. Enhanced local epidemiological capacity, better training of the staff, improved and more secure communication systems, and enhanced laboratory capacity, are only the first few steps that we have taken with the preparedness effort. With continued support and efforts, public health will be confident and capable enough to face any challenge to the health of its communities.

Please Welcome

J Greetings! It is an honor to serve you as the EpiCenter Director and newest member of
O the GLITC EpiCenter team. My 14 years of practicing public health in international and do-
H mestic settings, academic training (DrPH, MBA, MSPH, University of Alabama at Birming-
N ham; BS in Biology, Emory University), post-graduate training (CDC Epidemic Intelligence
Service, US Air Force Public Health, and US Peace Corps), have helped me prepare for
this wonderful opportunity. Working with you and the GLITC EpiCenter team, I look forward
to contributing as we strive to maintain and improve AI/AN public health. I am coming from
the Alabama Department of Public Health, where I was assigned from the CDC as a Career
M Epidemiology Field Officer to the department's Center for Emergency Preparedness (2002-
O 2004). Prior to this, I worked as a CDC Epidemic Intelligence Service officer at the CDC
S Dengue Branch in Puerto Rico (2000-2002). Before joining the CDC, I served as a US Air
E Force Public Health Officer, first in Okinawa, Japan (general base level public health, 1994-
L 1998), and then in Biloxi, Mississippi as a public health researcher (tobacco use) and as
Y Keesler Medical Center's Institutional Review Board coordinator (1998-2000). The title of
my doctorate dissertation was "A Qualitative Study of the Introduction of Strategic Manage-
ment into Thailand's Division of Occupational Health" (1994), and the title of my public
health master's thesis was "An Evaluation of the Cuban, Guatemala Solid Waste Disposal
System: Collection and Sanitary Landfill" (1987). Between 1987 and 1989, I served in the
US Peace Corps as a malaria control volunteer in southern Thailand; this was the period
after finishing my MSPH, but prior to starting on my DrPH and MBA. My wife, Benjamas
H Pongpu Hayes (from Thailand), our first child (Premjit Paula, 4 months old), and I are
A thrilled to begin experiencing the rich AI/AN culture and beautiful nature of the Bemidji area.
Y Until now we have been warm weather people -- Alabama, Thailand, southern Japan, Mis-
E sissippi, Puerto Rico -- but now we are ready to join in the fun of the wonderful North
S Woods lifestyle. Look forward to working for you and learning from you.
Please Note: Nancy Miller-Korth still works at GLITC, but in a different capacity.

Traditional Diets and the Effects of Mercury from Fish

Submitted by Michael J. Carvan, PhD, University of Wisconsin-Milwaukee

Diets with a substantial amount fish are health-
ier due to the lower fat content and higher levels
of vitamins, minerals, and omega-3 fatty acids in
fish, which can help reduce total blood chole-
sterol. Along with benefits obtained from fish con-
sumption, there are also some risks. The State
of Wisconsin advises fish consumers (especially
women of childbearing years, nursing mothers
and children under 15) to limit consumption of
many species of sport and recreational fish. The
fish from inland lakes in the state contain ele-
vated levels of mercury, which can permanently
damage the brain, kidneys, and developing fetus.
Effects on brain functioning may result in irritabil-
ity, shyness, tremors, changes in vision or hear-
ing, and memory problems. Very young children
are more sensitive than adults to the effects of
mercury and may accumulate significant levels
from their mother during pregnancy which may
lead to brain damage, mental retardation, incoor-

dination, blindness, seizures, and inability to
speak.

The mineral selenium has been shown to coun-
teract the effects of mercury, suggesting that di-
ets high in selenium may be protective against
the effects of mercury. Wild rice is rich in sele-
nium, and is also a significant component of the
diet of many Native American populations in Wis-
consin and the western Great Lakes region.

Our project is designed to assess the effects of
maternal mercury on offspring health and survival
and the protective effects of selenium. We are
using zebrafish in the laboratory to understand
how the brains of children are affected when their
mothers have been exposed to mercury, and how
a diet high in selenium may be protective. The
zebrafish is a small laboratory fish originally from
India that has become a very powerful model sys-
tem for studying the causes of human disease.

Continued on page 5



Zebrafish are tropical fish that have become powerful experimental animals for biomedical research. Adult zebrafish (left) are 1-2" long and their eggs (right) are about 1/25th of an inch.

The zebrafish is especially important for studying the way animals, including humans, develop from a single celled fertilized egg into a complete complex organism because they develop in pretty much the same way.

We are using zebrafish to understand how mercury exposure in the mother affects survival and behavior in her offspring, and how selenium is able to reduce these effects. We have been able to show that the effects of mercury on offspring survival can be lessened by selenium. Very low levels of selenium do not change the effects of mercury on the offspring, but moderate levels (those about equal with the mercury) do. Unfortunately, selenium is also toxic at high levels. We have been able to show that the behavior of baby zebrafish is affected by mercury and are in the process of testing the ability of selenium to reduce its effects. Affected fish do not respond to potentially dangerous situations the same way as normal fish. They are slower to respond, and once they respond, move much slower. This indicates that something has gone wrong in the way they perceive and respond to danger.

To figure out what is going wrong, we need to understand things at the molecular, or gene, level. Our genes control virtually every process in every cell by producing specific mRNAs which are used as a blueprint to make proteins, the primary functional molecules in the cell. Under normal conditions, the mRNA for a given gene is expressed at a relatively constant level. Under stressful conditions, the level of expression of many mRNAs change in response to the particular stressor. The changes in gene expression

provide a clue as to which genes are related to the stressor effects (e.g. mercury induced changes in behavior). We have recently developed a zebrafish microarray, a tool which allows us to measure the expression levels of over 5,000 genes at a time and are in the process of identifying which genes are changed by mercury and may lead to the behavioral effects described above.

For further information, please contact: Michael J. Carvan, Ph.D., at carvanmj@uwm.edu

References.

ToxFAQs for Mercury, ATSDR,
<http://www.atsdr.cdc.gov/tfacts46.htm> Statewide Mercury Advisory Background, Wisconsin DNR,
<http://dnr.wi.gov/org/water/fhp/fish/pages/consumption/mercury.shtml>

Upcoming Trainings

PCC Data Entry I
March 22-24, 2005
Homewood Suites, Bloomington, MN

Immunization
April 26, 2005
Kewadin Hotel, Sault Ste. Marie, MI

Community Health Representative
April 27-28, 2005
Kewadin Hotel, Sault Ste. Marie, MI

See website for further details:
[http:// www.glitc.org/epicenter](http://www.glitc.org/epicenter)

Great Lakes EpiCenter Mission: To support Tribal communities in their efforts to improve health by assisting with data needs through: Partnership Development, Community Based Research, Education, and Technical Assistance.

In This Issue	
2004 Community Health Profiles Overview	1
Bioterrorism, Emergency Preparedness and Tribal Centers	3
Traditional Diets and the Effects of Mercury from Fish	4
EpiCenter new Director	4
Upcoming Trainings	5

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