PUBLIC HEALTH SYMPOSIUM

November 12, 2010
8:00 am - 4:00 pm
Pyle Center
702 Langdon Street
Madison, Wisconsin
The Master of Public Health Program, established in 2005, provides multidisciplinary graduate education and training in public health concepts and methods to health professionals and students through a focus in service learning. Close connections with the community, through the Wisconsin Division of Public Health, the City of Milwaukee Health Department, and other health care and not-for-profit agencies, enable students to apply their skills in a real world setting. The MPH program’s vision is to develop a workforce that is competent to advance the well-being of the citizens of Wisconsin and beyond.

The Master of Public Health Program offers a unique educational experience that focuses on public health applications. The MPH degree is supported by a strong core of departmental faculty as well as program faculty spanning a broad array of departments including Family Medicine, Biostatistics and Medical Informatics, Law, Public Affairs, Nutritional Sciences, Nursing, Pharmacy, Veterinary Medicine, Social Work and several other departments across the School of Medicine and Public Health and the University of Wisconsin–Madison campus.
SYMPOSIUM AGENDA

7:30 am  Registration and Refreshments

8:00 am  Welcome  
Tom Oliver, PhD, MHA  
MPH Program Director

8:15 am  Storytelling for Community Health: A Program Evaluation of a Somali Mental Health Media Project  
Erin Aagesen

8:35 am  Predictors of the Diagnosis and Antibiotic Prescribing in Patients Presenting with Acute Respiratory Infections  
Ryan Joerres

8:55 am  Oral Health Care Practitioners’ Perceptions of Bisphosphonate-Related Osteoclonemecrosis of the Jaws  
Kelly Cotrell

9:15 am  Incorporating Secondary Prevention into Outpatient Stroke Rehabilitation Settings  
Matt Rafn

9:35 am  Institute for Clinical and Translational Research: Community Health Connections

10:05 am  Break

10:30 am  Quality Improvement Effort at Black Lion Hospital Emergency  
Roman Aydiko

10:50 am  Reducing Beryllium Exposure Risk: An ICP-MS Method to Determine Low-Level Beryllium in Occupational Samples  
Susan Percy

11:10 am  Improving Methicillin-Resistant Staphylococcus Aureus Infection Control Strategies: Identifying High-Risk Surgical Patients for Pre-Emptive Contact Isolation  
Katelyn Klein
11:30 am  T-cell Receptor Excision Circles Are Associated with Gestational Age: Data from Wisconsin Newborn Screening for Severe Combined Immunodeficiency
Anne Atkins

12:00 pm  Department of Health Services: Public Health Preparedness

12:30 pm  Lunch Buffet

1:00 pm  Keynote Alumni Speaker
Emelia McAuliff

1:45 pm  This Summer’s Hot Topic in Wisconsin: WASABE (Wisconsin Assessment of the Social and Built Environment)
Maggie Grabow

2:05 pm  ANEWC: A Statewide Study of Wisconsin’s Nutrition Environment
Nicole Brusky

2:25 pm  Prevalence of Medication Use among SHOW Participants
Jianhong Che

2:45 pm  Healthiest Wisconsin 2010 Progress Report: Existing, Emerging, and Re-emerging Communicable Diseases
Ryan Singh

3:05 pm  A Modern View of Cost Distribution in Emergency Medicine
Ben Weston

3:30 pm  Wisconsin Population Health Fellowship

4:00 pm  Alumni Reception
Fluno Center Study Pub
601 University Avenue

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Population Health Institute Fellowship

Community Panel:
Marian Ceraso, MHS, Associate Director for Outreach Education, Population Health Institute
Raisa Koltun, PharmD, MPH, Population Health Fellow
Paula Tran, MPH, Population Health Fellow

The Wisconsin Population Health Fellowship Program is a two-year service and training program designed for masters prepared individuals in public health and allied sciences. Candidates with doctoral degrees may also apply. The two-year program provides applicants with practical field assignments in community based, non-profit, governmental and health service organizations.

The primary goal of the Fellowship Program is to develop the next generation of public health practitioners skilled in planning, implementation, and evaluation of public health programs.

Dr. Thomas Oliver, Professor in the Department of Population Health Sciences and Director of the Master of Public Health Program provides faculty direction to the program. The program is modeled after national applied training programs, including the CDC Public Health Prevention Service Program.

At the heart of the program is a commitment to public service. Fellows receive direct hands-on training in high quality organizations working on relevant and timely public health issues. By the end of the two-year period, Fellows will have successfully completed the program's performance requirements. These requirements represent the core set of diverse skill sets necessary for managing public health programs. Placements have included the City of Milwaukee Health Department, State of Wisconsin and regional health departments, the March of Dimes, the American Cancer Society, Planned Parenthood, the Great Lakes Inter-Tribal Council, the Center for Resilient Cities and the Task Force on Family Violence.
A Modern View of Cost Distribution in Emergency Medicine
Ben Weston

Capstone Committee Members:
Michael Walters, MD, Clinical Associate Professor, Department of Medicine
Jim Svenson, MD, MS, Associate Professor (CHS), Department of Medicine
Barbara Duerst, RN, MS, Associate Director, MPH Program

As health care expenditures in the United States continue to rise, the emergency department has increasingly become an area of focus for cost management. In the early 1990s, a study of emergency room cost distribution found radiology and laboratory costs to account for a small proportion of total costs in low acuity patients. In presenting an updated evaluation of the distribution of emergency department costs by cost category and acuity level, one may begin to determine areas suitable for cost control. A retrospective chart review was performed of over 40,000 patients visiting the University of Wisconsin Emergency Department in 2009. Costs were broken down into the categories of facility, laboratory, pharmacy, radiology, and supply as well as by patient billing level. This updated evaluation of distribution of costs in the emergency department found facility costs to be highest across all billing levels, followed by radiology costs. An indirect relationship was found between the contribution of radiology costs and the patient acuity level (p=0.01), a finding in opposition to the earlier research by Williams. In addition, laboratory costs showed no significant relationship to patient acuity level (p=0.87). Our findings suggest that the contribution of radiologic and laboratory costs in low acuity patient is no longer as insignificant as it may have been 20 years ago. It is therefore important to consider cost saving strategies to target not only high acuity, high resource patients, but lower acuity patients as well. Further research is necessary to determine the generalizability of these findings.

Ben Weston, a dual degree MD/MPH student, completed his Bachelor of Science degree in Biology from Lawrence University. The Founder and President of Healthy Classrooms Foundation, Ben is a former member of the Dane County Medical Society Board of Trustees, as well as a former member of the House of Delegates for the Wisconsin Medical Society. Now in his last year of medical school, he plans to pursue a career in Emergency Medicine with an emphasis on public health.

Storytelling for Community Health: A Program Evaluation of a Somali Mental Health Media Project
Erin Aagesen

Capstone Committee Members:
Susan J. Zahner, DrPh, RN, Associate Professor, School of Nursing
Beth Mastin, Director, New Routes to Community Health
Dominique Brossard, PhD, Associate Professor, Department of Life Sciences Communication

Egal Shidad, a Somali media project in Minneapolis and St. Paul, is one of eight national grant sites of New Routes to Community Health (New Routes), a program of the Robert Wood Johnson Foundation and The Benton Foundation. The New Routes model is to form a three-year partnership between an immigrant organization, a media partner, and an administrative entity. The functional goal of these partnerships is to create media that address immigrant health priorities using a storytelling approach. However, the broader goal of New Routes is to facilitate a transformative process of participatory communication, through which participants foster leadership skills, develop new partnerships, and empower communities from within. Because a successful process is the primary goal, New Routes sought to elicit qualitative data on the operations of one grant site. Egal Shidad was selected as the featured grantee, with an emphasis on the topic of mental health. Semi-structured interviews (n=10) were conducted with participants to learn about partnership successes, challenges, and “lessons learned.” Participants identified community-level outcomes of the partnership, including: the initiation of a community conversation around “taboo” health topics, the use of storytelling to reduce cultural taboos, the strengthening of relationships between community organizations, increased capacity among participating organizations, the development of individual professional skills, and increased awareness of the health care needs of the Somali community. Identified challenges included: competing priorities of project partners, administrative barriers to consistent project progress, and the difficulty of measuring and reporting diffuse, community-level outcomes. Participatory communication partnership, while often administratively complicated, have the potential to impact the social determinants of health, setting them apart from traditional, top-down health communication approaches.

Erin Aagesen believes a good story has the power to change behavior and transform communities. Erin began her career as a marketing professional within the health care industry. After experiencing the challenges of developing simple, actionable messages within a complicated health care system, she pursued graduate studies in health communication and public health. Erin is currently employed as the Health Literacy Coordinator at Wisconsin Literacy, Inc., where she raises awareness, develops resources, and engages in local and national health literacy.
Healthiest Wisconsin 2010 Progress Report
Existing, Emerging, and Re-emerging Communicable Diseases

Capstone Committee Members:
Marilyn Haynes-Brokopp, MS, RN, APHN-BC, Clinical Associate Professor, UW School of Nursing
Kathryn Vedder, MD, MPH
Barbara Duerst, MS, RN, Associate Director, MPH Program

The state of Wisconsin’s public health plan for the decade 2000-2010, Healthiest Wisconsin 2010, addresses 11 health priorities. Included, are existing, emerging, and re-emerging communicable diseases. This report analyzes the progress made over the past ten years, toward the objectives set in the state health plan, with respect to the communicable disease section. Insight on the status of each of the 11 health priorities from the past decade is needed in order to modify the state health plan for Healthiest Wisconsin 2020. Four overarching objectives were set in the communicable disease section, but not all were met in the first ten years of the public health plan.

Information from existing literature that reported on the progress of the communicable disease priority, along with interviews of individuals involved in the preparation of Healthiest Wisconsin 2010 were analyzed. The final report was presented to the Wisconsin Public Health Council after being reviewed by the State Health Plan Committee. The progress report included the status of each sub-objective; whether it was achieved, if it was improved upon, if there was no progress made, or if data was unavailable. Recommendations for Healthiest Wisconsin 2020 were given for each of the four objectives set in the previous decade.

Ryan Singh is currently a childcare specialist at the Respite Center and personal aid for the Community Living Alliance. He holds a Bachelor’s degree in Sociology from UW-Madison. Ryan has a passion for helping the underprivileged individuals gain access to quality healthcare. He plans to fight for those who are disproportionately disadvantaged due to their socioeconomic circumstances by attaining a strong background in public health.

Predicators of the Diagnosis and Antibiotic Prescribing in Patients Presenting with Acute Respiratory Infections

Capstone Committee Members:
Dennis J. Baumgardner, MD, Director, Campus Research for Aurora UW Medical Group and the Center for Urban Population Health; Professor, Department of Family Medicine
Ajay K. Sethi, PhD, MHS, Assistant Professor, Department of Population Health Sciences
Christopher J. Crnich, MD, MS, Assistant Professor, Department of Medicine

A major component to the emergence of antibiotic resistance is the inappropriate prescribing of antibiotics. This practice, despite a lack of evidence-based support, is commonly seen in primary care clinicians diagnosing predominantly non-bacterial acute respiratory infections (ARIs), such as acute bronchitis. One study has revealed that clinician’s use of the term “chest cold” rather than “bronchitis” may improve patient satisfaction when an antibiotic is not prescribed for an ARI. We hypothesize in our study that primary care clinicians who diagnose a patient with an ARI are more likely to choose a bronchitis ICD-9 billing code when prescribing antibiotics. Using the Aurora Health Care clinic database, this study analyzed a random sample of patient visits (n=3,513) to one of 98 Aurora outpatient clinics in eastern Wisconsin. Multivariate analyses were performed using regression models entering significant (p<0.05) or borderline significant (p<0.15) variables identified by univariate analysis for potential predictors of the ARI diagnosis made and whether antibiotics would be prescribed. Potential predictors analyzed included patient demographics, geographic location of the clinic, time of season, clinician specialty, and ARI diagnosis. Overall, despite many significant differences in primary care specialty practices observed, results showed an acute bronchitis diagnosis to be the greatest significant predictor for the prescribing of antibiotics, and male gender to be the greatest significant predictor of being diagnosed with acute bronchitis. Further investigation into observed differences in clinician practices are needed, and whether choice of an ICD-9 billing code indicating bronchitis is sometimes used to “justify” the prescribing of antibiotics.

Ryan Joerres has a BS in Microbiology and Immunology from the UW-Madison. Before beginning the MPH program, Ryan worked as a registered Microbiologist at Froedtert Hospital in Milwaukee and part-time as an EMT. His interests are in vaccine-preventable diseases as well as maternal and child health. Ryan plans on graduating in December 2010 with his MPH degree and Global Health Certificate. Thanks to the continued love and support of his wife, Lisa, Ryan plans on applying to medical school and pursuing a career in pediatrics after graduation.
Prevalence of Medication Use among SHOW Participants

Jianhong Che

Culminating Experience Members:
Kristen Malecki, PhD, MPH, Associate Director, Survey of the Health of Wisconsin; Epidemiologist, Wisconsin Department of Health and Family Services
Javier Nieto, MD, PhD, MPH, Chair and Professor, Department of Population Health Sciences

The Survey of the Health of Wisconsin (SHOW) is the statewide research survey to measure information on critical health conditions, including medications taken. Medication use data from 611 Wisconsin participants were collected during 2008-2009. In order to be incorporated into further studies, these medication data must be examined and corrected before prevalence of medication use can be calculated. Almost 60% of the subjects who participated in the 2008-2009 survey were taking prescribed drugs. The top five medications used by SHOW participants are commonly prescribed for cardiovascular disease. Among participants, 25% were taking at least 5 medications and 8% were taking at least 10 medications. The highest number of medications taken by an individual was 15. The prevalence of medication use will be further analyzed according to age, gender, education, and insurance coverage, so that these results can be compared with other population-based studies of medication use in the US. There is a clear need for more advanced studies to evaluate drug use appropriateness, costs and effectiveness. Studying medication usage among SHOW participants will provide valuable information regarding the state residents’ health problems and will contribute towards improving the safety and effectiveness of pharmacotherapy.

Jianhong Che received a BS in Pharmacy from Zhejiang University in China, and a MS in General Biomedical Science from Northeastern University. Prior to coming to the MPH program, she was a research associate in the Marshfield Medical Research Foundation, focusing on identification and analysis of human short insertion/deletion polymorphisms and single nucleotide polymorphisms. During the past 4 years in the MPH program, she has been working as a pharmacy intern at the Beaver Dam Community Hospital. Since 2009, she has become a licensed pharmacist in Michigan. She plans to find employment that requires skills in public health research and pharmacy practice.

Oral Health Care Practitioners’ Perceptions of Bisphosphonate-Related Osteochemonecrosis of the Jaws

Kelly Cotrell

Culminating Experience Members:
Teresa Dolan DDS, MPH, Professor and Dean at the University of Florida, College of Dentistry
Javier Nieto, MD, PhD, MPH, Chair and Professor, Department of Population Health Sciences

Bisphosphonate medications are commonly prescribed drugs and are utilized in the management of osteoporosis, Paget’s disease, and for bone involvement in diseases like multiple myeloma, breast and prostate cancer. Bisphosphonate-related osteochemonecrosis of the jaw (BRONJ) is an uncommon clinical condition described in 2003. Patients present with exposed, necrotic bone in the jaws, which may be painful or infected. Most commonly the condition follows removal of a tooth, but it can also develop spontaneously. Research is being conducted to elucidate the pathogenesis, risk factors and treatment strategies but evidence based recommendations are still lacking. This study was conducted to determine the methods by which general dentists and dental specialists in the state of Florida first came to know about BRONJ, stay abreast of the current developments, their perceptions and beliefs about BRONJ and its impact on their daily practice.

Kelly Cotrell is an oral health care practitioner who will join the University of Florida, Department of Oral Diagnostic Sciences as a Fellow. Kelly earned her DDS from the University of Michigan. She earned a certificate in Oral and Maxillofacial Pathology from the University of Florida. Her public health interests are focused on access to care issues, oral health promotion, sleep disorders and oral pathology.
**ANEWC: A Statewide Study of Wisconsin’s Nutrition Environment**

Nicole Brusky

**Capstone Committee Members:**
Ana Martinez-Donate, PhD, Assistant Professor, Department of Population Health Sciences
Sara Soka, MS, Population Health Fellow, Population Health Institute
Kristen Malecki, PhD, MPH, Associate Director, Survey of the Health of Wisconsin; Epidemiologist, Wisconsin Department of Health and Family Services

Assessing the Nutrition Environment in Wisconsin Communities (ANEWC) aims to measure and quantify the food environments throughout different communities around the state of Wisconsin, and assess how they relate to the overall health of Wisconsin residents. Working in conjunction with the Survey of the Health of Wisconsin (SHOW), ANEWC is collecting data in the neighborhoods in which health data is also being collected to determine if there is any relationship between health status and the surrounding nutrition environment. ANEWC is helping to gain a better understanding of the food environment at the community level throughout the state, and provide information about potential food deserts or areas lacking in proper food choices. Statewide surveillance systems for the nutritional environment, like ANEWC, will prove to be beneficial in the future analysis of the health of Wisconsin as well as in the development of interventions aimed to improve the food environments of Wisconsin communities.

Nicole Brusky is planning on traveling to Haiti to teach in an English school for 6 months after graduation. Upon returning, she hopes to gain more experience in public health research, and continue on to medical school. Nicole plans to graduate with her MPH in spring 2011.

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**Incorporating Secondary Prevention into Outpatient Stroke Rehabilitation Settings**

Matt Rafn

**Capstone Committee Members:**
Fred Petillo, Acting Director, Wisconsin Heart Disease and Stroke Prevention Program, Wisconsin Division of Public Health
Mark Wegner, MD, MPH, Chronic Disease Medical Director, Wisconsin Division of Public Health
Thomas Oliver, PhD, MHA, Director, MPH Program; Professor, Department of Population Health Sciences

Much of cardiac rehabilitation focuses on preventing a second cardiac event, but the same is not true for stroke rehabilitation. As future public health professionals, it is essential that we identify avenues within the existing health care system where practitioners have the greatest chance to successfully influence patients’ negative health behaviors. While primary care has long been viewed as the best place to address modify health behaviors, rehabilitation programs offer a unique opportunity to discuss modifiable risk factors with patients. Publications dating to 1987 call for the need to incorporate secondary prevention into stroke rehabilitation. Today, the professional associations for physical and occupational therapists both recognize the importance of secondary prevention within rehabilitation, but ultimately do not incorporate it into the framework for everyday therapy practice. Our team sought to better understand the enabling conditions for developing an outpatient stroke registry, a quality improvement tool, for outpatient rehabilitation facilities. The registry will provide the qualitative data needed to drive quality improvement, and assist in identifying best practices for preventing a recurrent stroke. After conducting a literature search, a survey of 64 rehabilitation professionals, two focus groups and 36 in-depth interviews, we found varying degrees of treatment and outcome consensus across different rehabilitation providers. Our research suggests that secondary prevention is substantially unaddressed in the outpatient stroke rehabilitation setting and that the effectiveness of secondary prevention efforts that are performed goes largely unevaluated.

Matt Rafn received his Bachelor’s degree in Biochemistry from UW-Madison. He plans to complete his MPH degree this December 2010 and hopes to begin the University of Wisconsin’s Academy for Rural Medicine MD Program in the fall of 2011. Matt has served as co-president of the MPH Student Organization and as a teaching assistant for Health Systems, Management and Policy. Matt has a passion for addressing community based health education to decrease the number of preventable illnesses currently affecting the public. With an MPH degree, he believes he will be able to attack the root causes of some of the disparities in the community through wellness education and program development.
There is increasing research evidence that the built and social environment may provide or limit opportunities for physical activity behaviors. However, existing data still offer an unclear picture on what specific neighborhood elements are most relevant in explaining physical activity differences. This study will address this question by assessing attributes of the neighborhood environment of participants of the Survey of the Health of Wisconsin (SHOW). SHOW is an ongoing statewide household survey conducted with a representative sample of Wisconsin residents, with an approximate annual sample of 800-1000 adult residents. The survey is modeled after the National Health and Nutrition Examination Survey and involves a series of interviews, self-administered questionnaires, physical measures, and laboratory tests to collect individual- and household-level data. In the summer of 2010, SHOW’s data was extended with implementation of the Wisconsin Assessment of the Social and Built Environment (WASABE). WASABE is a direct observation instrument developed and validated by SHOW investigators to assess neighborhood indicators that may encourage or discourage physical activity. The instrument covers land use; availability of recreational facilities; non-residential destinations; safety from traffic; attractive features; signs of social capital, cohesiveness, and conflict; and presence of physically active models. The association between neighborhood-level characteristics and physical activity behaviors, obesity, and related health outcomes will be examined. Building on the current platform provided by the SHOW, this study will contribute to advancing the science regarding the influence of environmental factors on health behaviors and health outcomes.

Maggie Grabow will continue on to complete her PhD in Environment and Resources with the Nelson Institute for Environmental Studies following the completion of her MPH. In January, Maggie will begin as a National Science Foundation CHANGE IGERT Fellow at the Center for Sustainability and the Global Environment (SAGE), where she is advised by Dr. Jonathan Patz.
Quality Improvement Effort at Black Lion Hospital Emergency  
Roman Aydiko

Capstone Committee Members:
Lori Diprete Brown, MSPH, Assistant Director, Center for Global Health
Girma Tefera, MD, Assistant Professor, Department of Surgery
Assifu Woldetsdaik, MD, Black Lion Hospital

A Twinning Project between UW-Madison and Black Lion Hospital (BLH) emergency department in Addis Ababa, Ethiopia facilitates educational exchanges, theoretical and practical emergency fellow training, and Quality Improvement (QI) Work. As part of this larger project, I was involved as co-trainer a UW-Madison based QI course, and as an onsite QI coach at BLH for 10 weeks. I also carried out a QI study, a record review of the quality of triage. I provided Quality Improvement Awareness Workshops for 24 of the emergency department nurses. The course included defining quality for their setting, significance of dimensions of quality, and identifying and prioritizing problems. Through this QI Coaching, emergency department nurses were familiarized with the language of quality care, teamwork, and encouraged to build on culture of quality in their department. My other main activity, the triage study, demonstrated a dramatic improvement in the coverage and quality of triage in the emergency department. These results validated the ongoing QI efforts and motivated the staff to maintain improvements and continue with additional QI activities.

Roman Aydiko, a native of Ethiopia, received her undergraduate degree from University of Wisconsin-Madison, majoring in Biology and Women’s Studies. Roman is currently pursuing her Master of Public Health degree and Global Health Certificate. While pursuing her MPH, Roman worked as part of Surveillance and Outbreak Support Team in Wisconsin Division of Public Health, where she provided surveillance and investigation of enteric diseases that are food and waterborne outbreaks. Roman hopes to work more on this Twinning Project, before pursuing medical school. Following medical school, she hopes to pursue her dreams to contribute to her home country’s public health capacity building while creating educational exchange programs for individuals interested in international partnership building.

Keynote Presentation: Transitioning from Professional Student to Working Professional  
Emelia McAuliff

Emelia McAuliff received her bachelor’s degree in psychology and social welfare from the University of Wisconsin-Madison in May of 2003. Following completion of her undergraduate degree, Emmy worked at the Waisman Laboratory for Brain Imaging and Behavior as an Associate Research Specialist. While working at the Waisman Center, Emmy coordinated research studies on stress, depression and the social deficits seen in autism. Emmy entered the MPH program in 2006 and during her field work worked on the development and implementation of a novel childhood injury prevention program at the American Family Children’s Hospital. After receiving her MPH in 2008, Emmy took a position as an Assistant Researcher at the Center for Urban Population Health (CUPH). While working at CUPH Emmy participated in the development, implementation and evaluation of a violence prevention program in Milwaukee. Emmy currently works as an Outreach Specialist with the Bureau of Environmental and Occupational Health (BEOH) at the Wisconsin Division of Public Health. Her current position involves providing program management for a Centers for Disease Control and Prevention-funded illness surveillance program. Emmy also administers an Environmental Protection Agency grant targeting the development of an outreach program for beach safety. Most recently, Emmy has had the opportunity to work with BEOH colleagues on the development and expansion of Wisconsin’s Health Impact Assessment project.
Wisconsin Department of Health Services:
Public Health Preparedness

Community Panel:
Lisa Pentony, Director, Public Health Preparedness Program
Traci DeSalvo, MPH, Regional Coordinator/Local Liaison, Public Health Preparedness Program
Joe Cordova, Strategic National Stockpile Coordinator

The role of public health and the public health workforce in Wisconsin and throughout the nation has expanded in both scope and complexity. Bioterrorism events such as the anthrax scares following September 11, 2001; natural disasters like Hurricane Katrina and the 2009 Wisconsin floods; and emerging infectious diseases and outbreaks associated with HIV/AIDS and H1N1 influenza pandemic highlight the importance of the role of public health and its link to national security, individual, and community health.

Wisconsin’s Public Health Preparedness Program supports and enhances the capacity of the state, local public health departments/Tribes, and the healthcare system to prepare for public health threats and emergencies through planning, exercising, responding, and training. Public health is better equipped, has improved its response plans, is planning regionally as well as locally, is training staff, and has exercised the public health response plans across the state.

Reducing Beryllium Exposure Risk:
An ICP-MS Method to Determine Low-Level Beryllium in Occupational Samples

Susan Percy

Capstone Committee Members:
Marty Kanarek, PhD, MPH, Professor, Department of Population Health Sciences and Environmental Studies
Charles Brokopp, DrPh, Director, Wisconsin State Laboratory of Hygiene; Professor, Department of Population Health Sciences
Terry L Burk, CIH, Director, Occupational Health and Safety Division, Wisconsin State Laboratory of Hygiene

Workplace monitoring is an important component of occupational and environmental health prevention programs. Recently published governmental guidelines have significantly lowered occupational airborne beryllium levels. The goal of this MPH capstone project is to apply knowledge obtained on beryllium exposure and disease to develop an analytical method to detect low-level beryllium. Applications using beryllium are widespread and diverse. Inhalation exposures may result in beryllium sensitization and may progressively develop to chronic beryllium disease, a potentially fatal condition. Primary industrial users, former workers, operational bystanders and nearby community residents are at risk of exposure. There is life long risk of developing beryllium diseases even if the exposure is small or long past. Investigation indicates that previous monitoring limits were not effective in preventing new cases of chronic beryllium disease; thus a lower governmental standard was introduced. This method extracts beryllium occupational samples using dilute ammonium bifluoride and uses inductively coupled-plasma mass spectrometry for analysis. Key results include an estimated method detection limit of 0.02 µg/L, quantitative recoveries of beryllium oxide and interference free beryllium determinations. As regulatory efforts progress, worker protection can be better served by providing methods that can meet demands and are part of a comprehensive occupational surveillance program.

Susan Percy is a chemist in the Chemical Emergency Response Program at the Wisconsin State Laboratory of Hygiene. She is a lead worker and technical expert within the section developing and implementing analytical methods in support of CDC’s Chemical Laboratory Response Network. She provides technical support for instrumentation and testing procedures and has successfully participated in numerous proficiency testing and surge capacity exercises. Susan received a BS degree in Chemistry from UW-Madison and received extensive training and education in bioenvironmental engineering and medical services from the United States Air Force. She has previously worked on public health laboratory projects in the fields of occupational health and forensic toxicology and wishes to formalize her experiences with her MPH degree.
Improving Methicillin-Resistant Staphylococcus Aureus Infection Control Strategies: Identifying High-Risk Surgical Patients for Pre-emptive Contact Isolation

Katelyn Klein

Capstone Committee Members:
Ajay Sethi PhD, MHS, Assistant Professor, Department of Population Health Sciences
Linda McKinley, RN, MPH, CIC, William S Middleton VA Hospital
Kathy Matteson, BSN, CIC, William S Middleton VA Hospital

Methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the most frequently occurring hospital-acquired infections. Due to the burden to both patient health and health care costs, reduction in nosocomial MRSA transmission has been prioritized. One solution employed by the Veterans Affairs (VA) Hospital includes active MRSA screening for all patients upon admission. Although rapid PCR screening results are available within hours of admission, nursing staff are still responsible for admitting patients to single or double rooms before a patient’s MRSA status is known. Patients admitted to a double room who then screen positive for MRSA must be moved into isolation resulting in additional personnel time, patient dissatisfaction and admission delays. This process can be improved by identifying high-risk MRSA patients for rapid contact isolation upon room assignment, allowing for improved patient admission processes. In addition to this improvement, MRSA transmission can also be reduced. The aim is to identify risk factors for MRSA colonization to create and validate a clinical prediction model detecting unknown MRSA carriers eligible for pre-emptive isolation. A retrospective case-control study of VA surgical patients admitted between 6/1/2009 and 5/31/2010 was conducted to identify MRSA risk factors for use in the clinical prediction model. Data was collected from existing electronic medical records and analyzed using Stata software. This data was used to develop a predictive isolation model and will act as a quality improvement strategy and supplement the VA’s current infection control practices. Future goals for the project include hospital-wide implementation of the model to reduce nosocomial MRSA transmission, improve patient outcomes and admission processes.

Katelyn Klein is a second year MPH student with a background in microbiology and a passion for public health. To strike a balance between these two fields, Katelyn's interests lie in infectious disease epidemiology, specifically prevention of hospital acquired infections. After completion of her MPH degree, she will continue to pursue a career in nosocomial infection prevention.

T-cell Receptor Excision Circles Are Associated with Gestational Age: Data from Wisconsin Newborn Screening for Severe Combined Immunodeficiency

Anne Atkins

Capstone Committee Members:
Charles D. Brokopp, DrPH, Director, State Lab of Hygiene, Professor of Population Health Sciences
Mei Baker, MD, FACMG, Science Director, Newborn Screening Laboratory; Assistant Professor, Department of Pediatrics
Corinne D. Engelman, MSPH, PhD, Assistant Professor, Department of Population Health Sciences
Christine M. Seroogy, MD, Associate Professor, Department of Pediatrics

Severe combined immunodeficiency (SCID) is a fatal disease where T-cell development is blocked, leaving the patient without a functioning immune system. Newborns with SCID appear healthy at birth, but are extremely vulnerable to infection; and affected newborns usually die within the first year of life. Early diagnosis and treatment of SCID patients with curative approaches, such as bone marrow transplants have been shown to be life-saving. Newborn screening for SCID results in early identification and treatment. SCID was added to the Wisconsin Newborn Screening Program panel in 2008. The test measures T-cell receptor excision circles (TRECs) quantitated from the dried blood spots on the newborn screening sample collection card. TRECs are by-products of T cell development, and are present in healthy children and absent in patients with SCID. Since TRECs are a good surrogate marker of T cell development, we hypothesized that there is a difference in TREC numbers between full term newborns and preterm newborns. A total of 7530 newborn samples, 2510 preterm (gestational age (GA) 23-36 weeks) and 5020 full term (GA 37-40 weeks) were used to estimate the relationship between TREC value and gestational age. We observed a steady increase in the TREC value of newborns per week as gestational age increases. This association likely reflects progressive maturation of T cell development. In the newborn screening for SCID program, preterm newborns with low TREC values should be monitored by repeating the NBS assay for SCID in one or two week intervals until they reach an adjusted age of ≥ 37 weeks.

Anne Atkins graduated from UW-Madison with a BS in Genetics in May 2009, and will complete her MPH in May 2011. She currently works for the Wisconsin State Lab of Hygiene as an employee of the Newborn Screening Lab. Anne is interested in the intersection of public health, medicine, and genetics and plans on pursuing a medical career that allows her to keep investigating this dynamic interface.