Posters from the 2014 Michigan Epidemiology Conference

Talat Danish
Institute for Population Health

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Posters from the 2014 Michigan Epidemiology Conference

Talat Danish, MD, MPH, FAAP

In keeping with the tradition of providing broader dissemination of conference presentations it was decided that this volume of the *Michigan Journal of Public Health* would carry submitted posters from the Annual Michigan Epidemiology Conference. This conference is hosted by the Epidemiology Section of the Michigan Public Health Association annually, the mission of the section being “to foster communication and collaboration between epidemiologists in Michigan, and to promote epidemiology and public health through training, research and advocacy.”

Poster session presenters from the annual Michigan Epidemiology Conference were invited to submit their posters for publication in the *Michigan Journal of Public Health*. Submissions were accepted from two authors on subjects much in health news and very relevant to public health. One poster looks at NHANES data for use of energy drinks with interesting recommendations for future research, and the other poster attempts to predict health care costs associated with hospital acquired Methicillin Resistant Staph. Aureus and Clostridium Difficile infections.
Background
Healthcare-associated infections (HAIs) in acute care hospitals and long-term care facilities impose significant economic consequences on the healthcare system. HAIs cost U.S. hospitals $15.7 to $45 billion (2007 dollars) annually. We used published results from medical and epidemiological literature to provide a healthcare cost estimate for treating methicillin-resistant Staphylococcus aureus (MRSA) and Clostridium difficile infection (CDI) in Michigan.

Methods
The Michigan Department of Community Health (MDCH) Surveillance for Healthcare-Associated and Resistant Pathogens (SHARP) unit MRSA/CDI Prevention Initiative consists of 13 acute care hospitals and 12 skilled nursing facilities (SNFs). Acute care facilities submit MRSA/CDI laboratory-identified event data to the CDC National Healthcare Safety Network (NHSN) monthly, skilled nursing facilities submit faxed forms.

Data on events occurring between May 2012 and April 2013 was analyzed. Events were categorized according to specimen collection site and the International Classification of Diseases, Ninth Revision (ICD-9) codes: 008.45 Clostridium difficile; 038.12 S. aureus septicemia; 482.42 S. aureus pneumonia and 043.12 Other S. aureus infections. ICD-9 codes were inputted into the Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project database to estimate mean cost from Cost-to-Charge Ratios for the Midwest region.

<table>
<thead>
<tr>
<th>Healthcare-Associated Infection Type</th>
<th>ICD-9 Code</th>
<th>Cost, $ (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA (Total # cases)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Care</td>
<td>1366</td>
<td>1756</td>
</tr>
<tr>
<td>Skilled Nursing Facility</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>1404</td>
<td>1799</td>
</tr>
<tr>
<td>CDI (Total # cases)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Care</td>
<td>494</td>
<td>756</td>
</tr>
<tr>
<td>Skilled Nursing Facility</td>
<td>31</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>525</td>
<td>801</td>
</tr>
</tbody>
</table>

Results
The majority of acute care MRSA and CDI events were CO, with 63.8% and 56.8% respectively, while the majority of SNF events were HO, 86.4% and 90.7% respectively. Acute care facilities incurred $13,021,200 in MRSA-associated costs while skilled nursing facilities incurred $345,600. Acute care facilities incurred costs of $10,277,190 associated with CDI, and skilled nursing facilities $374,100. Other/Unspecified was the most frequently reported MRSA event type for both acute care and skilled nursing, with 44.1% and 97.3% respectively. The total combined financial burden of MRSA and CDI among the participating facilities was $37,022,100.

Conclusions
Data from this sample of 25 Michigan facilities provides a demonstration of the significant healthcare costs associated with MRSA and CDI. Although the sample size was small, the burden of HAIs is substantial, and prevention of MRSA and CDI among patients would reduce associated healthcare costs. Most HAIs are preventable with effective surveillance and control programs. The cost estimates in this study may be used to support investment in HAI reduction efforts.

Recommendation
Infection preventionists should utilize this data to build a business case for prevention and control measures which will ultimately reduce costs to patients, hospitals, and the healthcare system. Most importantly, these actions could lead to a reduction in patient harm.
Energy Drink Consumption: Data for the United States Based on the National Health and Nutrition Examination Survey, 2001-2010
Rebecca M. Brosig, Omayma Alshaarawy
Department of Epidemiology and Biostatistics, College of Human Medicine & Honors College, MSU

Introduction
For background, we note that energy drinks (ED) primarily are caffeine-containing beverages, sometimes with other chemicals declared to be ‘generally recognized as safe’ (GRAS) under federal food and drug law (e.g., taurine). We launched this research project thinking that NHANES datasets might allow study of co-occurrence of using energy drinks and alcoholic beverages during a 24 hour recall interval, with subsequent estimation of cross-sectional associations that link patterns of alcohol beverage consumption and energy drink use (EDU) with potential behavioral health disturbances (e.g., sleep duration). Initial analyses disclosed 24 hour EDU as quite rare, thwarting initial plans, and prompting new focal points. First, we present estimates for time trends in EDU occurrence across recent years. Second, we offer descriptive and exploratory estimates of subgroup variation across covariates of potential importance in future EDU-health research.

Sample and Methods
The National Health and Nutrition Examination Survey (NHANES) samples (2001-2010) are from a series of complex, stratified, multistage probability surveys of the US civilian noninstitutionalized population. In aggregate across all NHANES years from 2001 through 2010, the NHANES analysis sample includes 47,275 participants (who answered 24-hour dietary assessment questions).

NHANES computerized interview modules apply standardized item sets to assess all foods and beverages consumed in the 24 hours before assessment.

NHANES questions on alcohol and other drug use were asked only when participants had age 18 years or older (i.e., smaller aggregate sample for analyses with these variables).

Estimation is based on analysis weights, with Taylor series linearization to estimate variances appropriate for complex sample survey designs.

Results

Figure 1. Trends over time in energy drink consumption in the US

- Figure 1 depicts occurrence of energy drink use in relation to each survey year, with a generally sigmoidal shape.
- Histograms in Figure 2 indicate differences in recent energy drink consumption (p<0.05) for males, and for recent users of other drugs such as alcohol and tobacco.
- Age and sleep duration did not have palpable associations with energy drink consumption outcomes in this study (p>0.05).

Figure 2. Estimated prevalence of energy drink consumption across different subgroups.

Conclusions
Recently increased occurrence of energy drink use might have increased sharply over the past calendar year, but the USA now seems to be in an ‘asymptote’ interval, with occurrence of energy drink usage generally at the 1.7% level seen on each of several recent years. Irrespective of sex-related variations (a topic for a separate report), the analyses disclose no appreciable differences in occurrence subgroups defined by age (~21 versus 21 and older) or by sleep duration (which might be thought to have independent health effects and to be reduced by energy drink usage). In future research, with release of the newest NHANES data, we hope to be able to realize our original goal of studying suspected health effects of combined use of energy drinks and alcohol.

References & Acknowledgements
1. Agency provided valuable advice about prior presentation.

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