Mission Statement

The mission of the Michigan Journal of Public Health is to promote public health practice, research and policy with specific focus on Michigan and the Great Lakes Region. We encourage contributions from the field of practice, original research, opinion and commentary. It is the expressed interest of this Journal to encourage dissemination from the field of public health practice.

Statement of Affiliation with the Michigan Public Health Association

The Michigan Public Health Association (MPHA) is the organizing entity of the Michigan Journal of Public Health (MJPH) and is responsible for the publicizing and publication of the journal. The members of the Editorial Board are solicited from among public health practitioners and researchers, and approved by the Board of MPHA. MJPH Editorial Board members must also be members of MPHA and serve five year terms.
MJPH Editorial Board

MEMBERS:

Stephen Borders, PhD, MHA, School of Nonprofit and Public Administration, Grand Valley State University

Nicole Bradford, Western Michigan University

Greg Cline, PhD, School of Nonprofit and Public Administration, Grand Valley State University

Connie Currier, DrPH, MPH, College of Human Medicine Program in Public Health, Michigan State University

Talat Danish, MD, MPH, Detroit Department of Health & Wellness Promotion, Institute for Population Health

Richard L. Douglass, PhD, Department of Health Administration, College of Health and Human Services, Eastern Michigan University

Kieran Fogarty, PhD, Interdisciplinary Health Science PhD Program, Western Michigan University

Julie Gleason-Comstock, PhD, MCHES, Dept. of Family Medicine & Public Health Sciences; Center for Urban Studies, Wayne State University

Steven C. Gold, MPH, Department of Health and Community Services, Macomb County

Dana Rice, DrPH, Dept. of Family Medicine & Public Health Sciences, Wayne State University

Teresa Wehrwein, PhD, RN, College of Nursing, Michigan State University

Linda Zoeller, PhD, RN, Bronson School of Nursing, Western Michigan University

OFFICERS:

MJPH Editor: Julie Gleason-Comstock, PhD, MCHES
MJPH Associate Editor: Talat Danish, MD, MPH
Editorial Assistant: Jovan Glass, BA
Author Guidelines

STYLE:
APA, 12 point font, Times New Roman, double spaced, and 1” margin. We offer a variety of submission categories in order to welcome a varied audience within public health. Please see the required Manuscript Submission Format for submission. Students are also encouraged to submit original research or public health experiences.

SUBMISSION CATEGORIES:

Research and Practice Articles (Up to 15 pages or 3500 words excluding references, words in main text, a total of 4 standard digital photographs/tables/figures, and a structured abstract of 180 words) report the results of original quantitative and qualitative public health research. These may include, but are not limited to: evaluations/reports, demonstrations of innovative programs, best practice, exemplars/community-engaged scholarship, service learning, emerging problems, evidence-based practice and preliminary findings.

Commentaries (Up to 10 pages or 2500 words in main text, 2 tables/figures, and an unstructured abstract of 120 words) include scholarly essays, critical analyses, and policy papers.

Analytic Essays (Up to 15 pages or 3500 words excluding references, in main text, a total of 4 standard digital photographs/tables/figures, and an unstructured abstract of 120 words) provide a forum for critical analyses of public health issues from disciplines other than the biomedical sciences, including, but not limited to: the social sciences, human rights, and ethics.

Briefs (Up to 4 pages or 500 words excluding references, in main text, 2 tables/figures, and an abstract of up to 80 words) provide preliminary or novel findings.

Editorials (May not exceed 1200 words) are solicited based on recommendations from the Editorial Board, or members of MPHA. All recommendations require approval from the MJPH Editorial Board.

Letters to MJPH (Must not exceed 400 words and contain no more than 10 references) are encouraged by our readers. Letters may include any public health topic. Provide a separate list, or refer in the text to the location of available educational materials or community tools that you found especially helpful. If you would like the resource posted with the electronic version of the journal on the MPHA website, provide it with the submission.
Notes from the Field invites submissions of new or emerging issues, and underrepresented voices in community and public health. This category is designed to promote the exchange of ideas and practices amongst public health practitioners, thus, perspectives on new or effective community/field practices are encouraged. “Notes” is also intended to enhance sharing insights, issues, innovations and new approaches to our shared problems. “Notes” will often not be considered research projects and are not subjected to the normal peer review process of practice and research articles, but may be sent for content review at the discretion of the editor. However, authors should be aware that some information/data in Notes from the Field may require IRB and/or HIPAA review. The manuscript should be 750 words or less in a common electronic text format. No more than two graphics may be included. Graphics include pictures, charts, graphs and tables.

SUBMISSION PROCESS FOR ALL MANUSCRIPTS

1) Manuscript Submission Form.

- All authors must sign and submit via surface mail an original copy of the submission form.

2) MJPH Manuscript Format.

- Please complete and submit in the Manuscript Format, following guidelines including: Abstract, Introduction, Methods, Results, Conclusions, and Discussion. Additional sections may be added to the form as appropriate.

Both the Manuscript Submission Form and Manuscript Format are available on the MPHA website (www.mipha.org) Michigan Journal of Public Health page. Please send only electronic submissions to:

Julie Gleason-Comstock, PhD, MCHES, Editor
jgleason@med.wayne.edu
# Table of Contents

## EDITORIAL

Public Health Heart and Soul: Jean Ellen Chabut

*Julie Gleason-Comstock, PhD, MCHES, Steven C. Gold, MPH and Greg Cline, PhD*

## RESEARCH & PRACTICE

Restructuring the Michigan Child Care Fund

*David Wingard, PhD, Kieran Fogarty, PhD, Mary Lagerwey, RN, PhD, Joshua Scott, MS*

Health Services Use and Expenditure Patterns of Dual Eligibles in Michigan

*Cristian Meghea, PhD, William Corser, PhD, RN, Qi Zhu, MS*

## BRIEFS

Posters from the 2014 Michigan Epidemiology Conference

*Talat Danish, MD, MPH, FAAP*

The MDCH SHARP MRSA/CDI Prevention Initiative: A Cost Analysis

*Noreen Mollon, MS, Bryan Buckley, MPH, Gail Denkins, RN, BS, Jennie Finks, DVM, MVPH*

Energy Drink Consumption: Data for the US Based on National Health and Nutrition Examination Survey, 2001 – 2010

*Rebecca Brosig, Omayma Alshaarawy*
Public Health Heart and Soul:
Jean Ellen Chabut, BSN, MPH (1942-2014)

Reflections from
Julie Gleason-Comstock, PhD, MCHES, Steven C. Gold, MPH, Greg Cline, PhD

Julie Gleason-Comstock

If you worked in public health in Michigan in the last four decades, you were likely – and lucky – to have met - and to know - Jean Chabut. While I can only speak for the last two decades, the first time I “saw” Jean was in 1989 in a Detroit Health Department Conference Room picture of 1960’s public health nurses – the heart and soul of public health. When I returned to the Michigan Department of Public Health (MDCH) Special Office on AIDS Prevention (aka SOAP) the next day, my boss, Randy Pope, assured me the Deputy Director was the same Jean – with the same spirit. Jean had the ability to weave herself into the rich fabric of Michigan public health. You could see her at a Conference in Grand Rapids rallying the Michigan Public Health Association, or sit across the table from her as she chaired the Prevention Research Council in Okemos, and know she would fight for the best in public health, and challenge and encourage anyone in the room (or out of the room, for that matter).

An interview with Jean by Dr. Richard Douglass, MJPH Editorial Board member and Emeritus Eastern Michigan University Faculty provided a window illustrating the clarity of her public health vision. When asked about initiatives that could stimulate community-based participatory research, a topic of interest to the Journal, Jean suggested “Community Health Hubs” that could do for adult health and geriatrics what traditional primary care and family
medicine had done for pediatrics and child health. This would include the use of local “indigenous” Community Care Case Workers who would focus on chronic disease management. Overcoming barriers to making this effort a “billable service” would be a challenge to health services management, an important epidemiologic research question, and would extend a viable continuum of public health services from childhood up to the elderly.

It is with the greatest respect we celebrate Jean’s pragmatic life in public health, and it is incumbent upon us to focus our vision as new challenges arise. A number of Michigan Journal of Public Health Editorial Board members, including myself, considered Jean a mentor as well as a public health leader. Those thoughts follow from Steve Gold, MPH, Director of the Macomb County Department of Health and Community Services, and Greg Cline, PhD, Assistant Professor of Public and Health Administration at Grand Valley State University.

Steve Gold

My first encounter with Jean Chabut was in the early 1980’s - a time of significant organizational change for public health in Southeast Michigan. In those years I occupied my first administrative position - Director of Nutrition Services for the MIC-PRESCAD Project. MIC-PRESCAD was a categorical, Federally-funded project providing “Maternal & Infant Care - Preschool, School-age, and Adolescent Health Care” to thousands of low-income women and children each year in Detroit and Wayne County. The effects of President Reagan’s M&CH Block Grant initiative - funding reductions, for the most part - were beginning to be felt, and the freestanding categoricals were shrinking or disappearing.

MIC-PRESCAD’s assets (including its administrative staff) were to be divided between the Detroit and Wayne County health departments, and Jean represented DHD at a meeting I
attended to work on who would be responsible for what. Although I was the most junior person at the table, I remember challenging Jean, insisting that she tell me whether or not the detailed program objectives written by MIC-PRESCAD staff would be adopted and carried forward by Detroit when they took over the city-side facilities.

Only a few years my senior in age, Jean was vastly my superior in experience. She turned to look me in the eyes, smiled in a way that had little to do with humor, and said “Well Steve, I guess you’ll be informed about that when and if you need to know.” In a second my balloon of self-importance was popped, and I saw that I had seriously misunderstood my place in the scheme of things. Much later in our relationship I had occasion to remind her of that first meeting, and to apologize for the rudeness of my younger self. Jean dismissed what I remembered as a terrible faux pas graciously, telling me that she tried not be distracted by petty matters when there was real work to be done. This was a lesson I saw Jean Chabut demonstrate more than once in the thirty years I was privileged to know her. Her life in public health was indeed a pragmatic one, explaining in part why she was always such an effective leader.

**Greg Cline**

Unlike the others, I don’t recall when I first met Jean. My guess it was a brief encounter sometime in the mid 90s when I was an entry level research associate at the Michigan Public Health Institute (MPHI) . What I remember about Jean, though, is that she treated everyone in public health with great warmth and kindness regardless of level or assigned tasks. Her memory was stunning, early on I realized she never forgot my name (or others’) and always greeted me with a warm smile and hearty hello. She was always the expert, always the lead, but also always engaging all those around her in whatever work with which she was focused.
As time went by and I found myself more often in Jean’s presence – normally participation on some project Steering Committee – what struck me was how it was her humanity that lit up rooms and by which she led so many of us so well. This I am sure was what makes us all miss her so. Despite her depth and breadth of knowledge, decades of experience and administrative acumen – what made us want to work was her warm, caring magnetism.
Restructuring the Michigan Child Care Fund:
Reducing Costs and Improving Outcomes

David Wingard PhD
Kieran J. Fogarty, PhD
Mary Lagerwey, RN, PhD
Joshua Scott, MS

1Director of Research and Strategic Development,
TrueNorth Community Services, Fremont, Michigan

2Interdisciplinary Health Sciences PhD Program, College of Health and Human Services,
Western Michigan University, Kalamazoo, Michigan

3Bronson School of Nursing, College of Health and Human Services,
Western Michigan University, Kalamazoo, Michigan

Corresponding Author:
David Wingard PhD
Director of Research and Strategic Development
TrueNorth Community Services
Fremont, Michigan
dwingard@truenorthservices.org
Abstract

Michigan’s policy to distribute the Child Care Fund (CCF) to counties at a flat rate of 50% as stated in the Michigan Comprehensive Laws 400.117a provides no structured incentive to the counties to use evidence based practices that are cost-effective for locally based delinquent youth intervention programs. This policy analysis answers the following questions: (1) would retaining delinquent youth in the community produce a cost benefit and/or better outcomes than confinement and (2) is public safety at risk if delinquent youth are retained in the community? Utilizing a policy analysis framework our evidence found that community based services provide better outcomes than confinement for delinquent youth and that retaining delinquent youth in the community does not represent an increased risk to public safety. Policy change is recommended to incentivize the use of best practices which may produce significant economic and social benefits to the state and delinquent youth who should receive the best possible care. This can be accomplished through a shift in state reimbursement rates from the current 50% rate to an increased rate for evidence based strategies.
Introduction

Michigan’s policy to distribute the Child Care Fund (CCF) to counties at a flat rate of 50% as stated in the Michigan Comprehensive Laws 400.117a provides no structured incentive to the counties to use evidence based practices that are cost-effective for locally based delinquent youth intervention programs. Michigan Governor Rick Snyder’s 2014 proposed budget based on current spending trends, provided $177.5 million for the county Child Care Fund, a reduction of $11.1 million or 6% from current year expenditures of $188.7 million. The Child Care Fund provides for the care and treatment of delinquent or maltreated children who are court wards and not eligible for federal payments through Title IV-E. The primary sources of funding for the Child Care Fund are state General Funds and federal Temporary Assistance for Needy Families (TANF). Based on the May 15th consensus agreement, the Conference Committee provided $171 million for the Child Care Fund. The Senate also added $1.5 million for counties to expand their in-home, community-based juvenile justice programs.

Counties in Michigan face financial challenges related to the high cost of services for delinquent youth. For example, in Muskegon County, the Family Court Administration manages the Child Care Fund budget. In 2006, Muskegon County spent an average of $50.00 per day for community based in-home services. This compares to an average per day cost of $225.00 per day for confined youth (Wishka, 2006). This positive example may be replicable state wide and could be encouraged through policy changes.

At a time of crisis it is essential for Michigan to invest in practices that have evidence of effectiveness with juvenile delinquents. Other states, including Pennsylvania, Ohio, California, and New York, have already enacted incentivized financial structures and have experienced a
cost benefit resulting from the encouraged application of evidence based practice with juvenile delinquents (Drake, 2007).

**Objective**

This policy analysis utilizes a systematic economic framework to examine the Michigan’s existing CCF reimbursement policy and answers the following questions: (1) would retaining delinquent youth in the community produce a cost benefit and/or better outcomes than confinement and (2) is public safety at risk if delinquent youth are retained in the community?

Although there clearly is no explicit policy statement favoring confinement of youth, the current CCF funding structure reimburses counties for 50% of the cost of child care regardless of expenditure type or effectiveness. Counties that place youth in residential confinement are reimbursed at the same rate as counties that retain youth in their communities with the support of evidence based services. When faced with the choice of intervention for a delinquent youth there is no formally structured incentive in the CCF to evaluate effectiveness of alternatives and there is no structured incentive to avoid high cost confinements. In fact, the political pressure to remove and confine youth who represent potential threats to public safety provides incentives for court systems to confine as many youth as possible to achieve a short term reduction in criminal conduct and offer a politically popular "tough on crime" image to the public.

A careful consideration of the Michigan’s CCF Policy must also consider the ethical issues related to justice. The defining point of ethics relevant to this discussion involves two competing theories, retributive justice and restorative justice. Retributive justice stems from the Western Civilization ethical foundation rooted in the concept that justice occurs when the punishment fits the crime (Leighton, 2000). Retributive justice is reactionary; punishment is the community’s response to a past event of injustice or wrongdoing. It acts to reinforce rules that
have been broken and balance the scales of justice by the criminal paying back the debt to society (Brian, 1989).

Restorative justice focuses on the communal aspects of relationships in society. Crime, in the restorative justice view, is an action that violates relationships. The goal is to reintegrate the offender into society as opposed to exiling the offender from the community to an institution (Umbreit & Armour, 2009); this allows the opportunity for him or her to repair the damage done. Restorative justice is forward looking and seeking the future re-engagement of both victim and offender into a cohesive community. Instead of emphasizing punishment and labeling an offender as "bad" and an outcast, the approach gives priority to restoring the community and incorporating the offender back into it (Umbreit & Armour, 2009).

Based on a previous review of scientific evidence (Umbreit & Armour, 2009), the practice of restorative justice is preferred; the greatest good for the community can be achieved when the best outcome is attained with the least cost. The traditional approach of retributive justice isolates youth from their community without providing evidence of benefit to the youth. The research cited in the aforementioned analysis (Umbreit & Armour, 2009) supports that, due to high recidivism rates and high costs, retributive justice fails to provide the greatest good for youth or the community.

It is important to note that an unintended consequence of the incentivized community based services could be poor decision making on the part of some counties to retain high risk youth who legitimately should be confined. While this concern has not been manifested in other states that have pursued such policies (Juvenile Justice Evaluation Center, 2002; Justice Policy Institute 2009), counties under severe financial pressures could feel pressured to make placement decisions that are questionable.
Policy Analysis Methodology

The methodology for this policy analysis will employ a policy analysis framework from Thomas Collins (Collins, 2005). This framework was chosen due to the compatibility with cost effectiveness analysis. Collins framework includes definition of contextual factors, problem statement, investigation of evidence, consideration of options, application of evaluative criteria and decision recommendations (Collins, 2005). In order to evaluate the existing Michigan Child Care Fund policy as it stands versus the possibility of an alternative policy that would incentivize local community based services the following two critical questions must be addressed: (1) would retaining delinquent youth in the community produce a cost benefit and/or better outcomes than confinement and (2) is public safety at risk if delinquent youth are retained in the community? A literature review informed by these questions was conducted. The Scopus Database was utilized for the review. The search was conducted from publications within the years 2000 to 2013. Search keywords included “juvenile delinquency,” and “cost effectiveness.” In addition to the literature review, the analysis was based on state/county level data directly related to each of these questions.

Results

Question One: Does retaining delinquent youth in the community produce a cost benefit and/or better outcomes than confinement?

An important method for comparing program outcomes is cost-effectiveness analysis; these evaluations make it possible to compare programs that produce similar results, allowing policymakers to achieve the largest possible crime-prevention effect for a given level of funding (Greenwood, 2008). The Washington State Institute for Public Policy (WSIPP) has done a cost-benefit analysis of juvenile justice programs. It showed that programs using evidence based
practices like those endorsed by the Office of Juvenile Justice and Delinquency Prevention (OJJDP) and Blueprints (www.colorado.edu/cspv/blueprints/) are the best ways to help delinquent youth and also save money (Aos, 2006). Of the five most cost effective services identified by the WSIPP study, all are community based. The most cost effective service, Multidimensional Treatment Foster Care reduced crime recidivism rates by 22% and achieved a per participant cost saving relative to confinement alternatives of $77,798 (Aos, 2006, p. 9). In contrast, confinement of youth has failed to show positive outcomes and in many cases may actually be detrimental to the social and psychological development of juveniles. This may be due to situations where large numbers of youth with histories of violence or psycho-social problems are crowded into a confined space.

A recently published study for the Campbell Collaboration (Petrosino, Turpin-Petrosino, & Guckenburg, 2010) evaluated the question “does system processing reduce delinquency?” In the evaluation of 29 studies, juveniles were assigned to either the juvenile justice system or non-system alternative to include a total 7,304 juveniles over a 35-year period. The results indicated that juvenile system processing does not appear to have a crime control effect. The authors reported that almost all of the results are negative in direction, as measured by prevalence, incidence, severity, and self-report outcomes (Petrosino et al., 2010). Moreover, there is increased cost linked with system processing and a significant lack of evidence supporting a public safety benefit.

Research also supports that involvement in the traditional juvenile system may result in increased risk for adult incarceration. Gatti et. al. (2009) used data from a community sample of 779 males under the age of 17 and found that any intervention by the juvenile court has an increased likelihood of involvement with the judicial system in adulthood. The results also
suggested that the various measures recommended by the juvenile court contribute unequally to the effect. Those delinquent youth who experienced placement had the most negative impact.

The rate at which youth re-offend, or recidivism, is an important measure of the effectiveness of a delinquency intervention. Research on recidivism indicates that youth who are confined re-offend at an accelerated rate when compared to delinquent youth who were not confined. In a study done by the Justice Policy Institute (Justice Policy Institute, 2009), approximately 60 percent of youth who were in residential placement facilities were rearrested within two years of their release.

*Question Two: Is public safety at risk if delinquent youth are retained in the community?*

Question two is a commonly heard objection that is not substantiated by research. The Justice Policy Institute finds "no correlation between states that increase the number of youth in juvenile facilities and crime." (Justice Policy Institute, 2009, p. 10). Six of ten states that increased the number of juveniles in facilities from 1996 to 2006 actually saw an *increase* in violent offences reported to law enforcement (Sickmund et al., 2008). Given the evidence of these studies it does not appear that public safety is at risk by retaining delinquent youth in the community. Higher rates of confinement do not correlate with improved measures of short term public safety and may in fact contribute to greater likelihood of adult incarceration.

**Conclusions/Recommendations**

As a result of this analysis, a change in the existing policy is recommended. Incentivizing the use of best practices may produce significant economic and social benefits to the state and most importantly to the delinquent youth who should receive the best possible care.
This can be accomplished through a shift in state reimbursement rates from the current 50% rate to an increased rate for evidence based strategies. If local counties received a financially incentivized reimbursement for in home care or other local and evidence based options, the adoption of such practice would be strongly encouraged. Additionally, dollars would remain in the state and benefit other economically strapped programs. Anecdotal evidence such as the experience of Muskegon County (Wishka, 2006) and a review of literature such as the WSIPP (Aos, 2006) suggest that the cost of community based services is significantly less than the cost of confinement. The potential financial savings have benefits including allowing greater numbers of youth to receive services. More research is needed on populations in Michigan. Until that research is available, the findings from the literature suggest that there are expected advantages to both cost and outcomes for youth. These financial advantages could be the basis for identifying a rate of incentivization for evidence based practices. Finally, youth in the community with effective services may have additional value added benefits such as long term reduction in adult incarceration rates and increasing social capital.

A final recommendation is that a strategic framework be identified or developed that will support the effort to incentivize implementation of evidence based practices. Many counties, especially in rural areas of Michigan will not have the capacity or resources immediately available to take advantage of the benefits from the policy change. Provision of a strategic framework and support of the framework through training and consultation would allow for the capacity enhancements necessary to effectively engage in the use of evidence based practice. These supports would assist counties through the identification of locally relevant evidence based practice, development of new services, and practice using a strategic framework to support outcome evaluation and service effectiveness.
The evidence found in this analysis supports the following: less costly, community based services qualify as evidence based practices, community based services provide better outcomes than confinement for delinquent youth, retaining delinquent youth in the community does not represent an increased risk to public safety, and financial structures that incentivize evidence based practice have been successfully implemented in other states.
Research and Practice: Restructuring the Michigan Child Care Fund: Reducing Costs and Improving Outcomes

References


Definitions; Juvenile Justice Funding System; Rules; Distribution of Money for Cost of Juvenile Justice Services; Guidelines, 400.117 onecle § 400.117 (2004).


Program By Program Review of Recidivism Measures at Major Facilities for Department of Juvenile Justice Youths (Fact Sheet).


The Impact of Incarcerating Youth in Detention and Other Secure Facilities (Justice Policy Institute).


Health Service Use and Expenditure Patterns of Dual Eligibles in Michigan

Cristian Meghea, PhD\textsuperscript{1,2}

William Corser, PhD, RN\textsuperscript{1}

Qi Zhu, MS\textsuperscript{1}

\textsuperscript{1}Institute for Health Policy, Michigan State University, East Lansing, Michigan 48824

\textsuperscript{2}Department of Obstetrics, Gynecology, and Reproductive Biology, Michigan State University, East Lansing, Michigan 48824

Corresponding author:
Cristian Meghea, PhD
Assistant Professor
Institute for Health Policy and Department of Obstetrics, Gynecology, and Reproductive Biology
Michigan State University
965 Fee Rd., Room A632-B
East Lansing, MI 48824
Email: Cristian.Meghea@hc.msu.edu
Phone: 5178843955
Fax: 5173531663
Abstract

Objective: The objective is to provide a statewide population-based comparison of Michigan beneficiaries dually eligible for Medicare and Medicaid (duals) to Medicare-only beneficiaries, including the public health expenditures by service type, and to focus on the LTC service use patterns of elderly duals receiving care in various settings.

Data Sources: Data sources were linked 2005 and 2006 individual Medicaid and Medicare claims from all Michigan duals.

Methods: CMS provided Medicare claims and beneficiary data. Michigan Department of Community Health provided Medicaid claims data.

Design: We compared characteristics and health expenditures across various categories of beneficiaries and LTC care settings.

Principal Findings: The 13% duals accounted for 33% of total Medicare and Medicaid expenditures. Eight percent of elderly beneficiaries were duals in 2005, accounting for 26% of public health expenditures in the aged. The average monthly expenditures of elderly duals were: $4,896 in institutional LTC, $2,921 for those served through HCBS waiver programs, and $1,488 for those in the community.

Conclusions: Duals in Michigan account for a disproportionate large share of state and federal health expenditures. Michigan’s experience suggests that LTC services can be offered in home and community-based settings, at lower costs compared to institutional LTC. The shift in prescription drug coverage from Medicaid to Medicare increased the drug expenditures for some duals and had limited impact on overall dual expenditures. Results may be pertinent within the context of impending healthcare reforms.

Keywords: Dually Eligible; Medicaid; Medicare; Michigan
Introduction

In the United States, individuals dually eligible for Medicare and Medicaid (duals) are high-expenditure beneficiaries. Although duals comprise approximately 15% of all Medicaid enrollees, they account for nearly 40% of total Medicaid healthcare expenditures (Yip, Nishita, Crimmins, & Wilber, 2007; Brue & Holahan, 2003; Rousseau, et al., 2010).

Approximately one fifth of Medicare beneficiaries are duals, accounting for 24% of total Medicare spending (Rousseau, et al., 2010). Duals are one of the most vulnerable populations being served by any publicly funded health care program (Brue & Holahan, 2003; Moon & Shin, 2006). Duals are significantly poorer and sicker than Medicare-only beneficiaries, consume more healthcare services, and have more long-term care (LTC) needs than Medicare-only beneficiaries (Yip, Nishita, Crimmins, & Wilber, 2007; ; Rousseau, et al., 2010; Moon & Shin, 2006).

The most physically impaired duals tend to be elderly beneficiaries residing in nursing homes (Yip, Nishita, Crimmins, & Wilber, 2007). By far the costliest type of Medicaid expenditure incurred by the duals is for LTC nursing home room and board services, with the majority of services consumed by the elderly (Kaiser Commission on Medicaid Facts, 2011). A relatively small proportion of duals continue to consume the vast majority of available LTC resources (Yip, Nishita, Crimmins, & Wilber, 2007; Rousseau, et al., 2010; Moon & Shin, 2006; Kaiser Commission on Medicaid Facts, 2011).

Most such LTC services are covered by Medicaid and provide duals with both medical and non-medical care activities concerning daily dressing, bathing, and toileting tasks. These types of LTC services can also be provided at duals’ homes in the community through Medicaid state waiver programs (Rousseau, et al., 2010; Kaiser Commission on Medicaid Facts, 2011).
Michigan, the Home and Community-Based Services (HCBS) waiver program, MI Choice, was designed to enable elderly and disabled duals prevent or delay transfer to an institution by providing them LTC home-based services and support, while also anticipating fiscal savings.

The various settings and programs through which duals can receive services are important determinants of their costs and payment coverage. For example, Medicaid pays 55% of LTC expenditures and Medicare pays for 21% of expenditures for duals residing in LTC nursing home facilities (Yip, Nishita, Crimmins, & Wilber, 2007; Rousseau, et al., 2010). Another 16% is out of pocket, and the remaining 8% of total expenditures are primarily covered by private insurance. In contrast, Medicaid covers only 17% of expenses for community-dwelling duals’ care, with Medicare covering approximately 70% (Yip, Nishita, Crimmins, & Wilber, 2007).

Enacted in 2003, the *Medicare Prescription Drug, Improvement, and Modernization Act* (MMA) resulted in the largest overhaul of Medicare in its then 38-year history (U.S. Department of Health and Human Services, 2012a). One of the most significant provisions in the MMA was the establishment of a 2006 federal entitlement benefit for prescription drugs for all Medicare beneficiaries (Medicare Part D). The enactment of Part D shifted payments for most duals’ prescription drugs from Medicaid to Medicare as of January 1st, 2006 (Department of Health and Human Services, 2012b). The resultant changes in drug coverage and expenditures for duals in national samples have already been documented (Henry J. Kaiser Family Foundation, 2012; Bradley, Dahman, Bataski, & Koroukian, 2010; Bagchi, Esposito, & Verdier, 2007; Basu, Yin, & Alexander, 2010).

Relatively few studies to date have examined overall patterns of healthcare utilization and LTC service use for an entire state’s population of duals. In addition, broad changes in service
use and expenditures during the notable coverage shifts imposed by the MMA have been understudied. It is increasingly important to better understand how future coverage changes may influence the healthcare use patterns and expenditures of different types of duals (Kaiser Commission on Medicaid Facts, 2011; Center for Health Care Strategies, 2010a).

Our specific objectives were to provide a statewide population-based comparison of Michigan duals to Medicare-only beneficiaries, including the public health expenditures by service type, and to focus on the LTC service use patterns of elderly duals receiving care in various settings. We present population characteristics and patterns of expenditures around the time of the significant shift in prescription drug coverage imposed by the enactment of Medicare Part D.

Methods

Population. This study profiled the entire population of Michigan Medicare-eligible beneficiaries during 2005 and 2006. We performed distinct calendar-year analyses for the population eligible in 2005 and in 2006. Dually eligible beneficiaries were compared to beneficiaries eligible only for Medicare. Analyses then focused on the population of elderly duals, aged 65 or older, and further on the elderly duals in long-term care.

Data Sources. Linked Medicaid and Medicare individual-level data formed the foundation for these analyses. Fee-for-service (FFS) Medicaid claims/encounters during calendar years 2005 and 2006 provided one portion of data at two points in time for analyzing the service use and expenditure patterns of all Michigan duals. Fee-for-service Medicare claims/encounters data during the same period completed the data set used for these analyses. The Medicare data were obtained from the federal Center for Medicaid and Medicare Services (CMS), while the
Medicaid data came from the Michigan Department of Community Health (MDCH) Data Warehouse (Michigan Department of Community Health, 2012).

The linked Medicare beneficiary summary file included the demographic characteristics. Seven comprehensive types of Medicare claims data were used: inpatient hospital, outpatient hospital and clinic, physician, skilled nursing facility, home health agency, hospice claims, and prescription drugs for 2006. Physician claims were extracted from the carrier claims Medicare file containing claims submitted by non-institutional providers (over 95% of these claims were submitted by physicians). We grouped the Medicaid claims into similar service use categories so that equivalent comparisons of the Medicaid-Medicare service use and expenditure patterns could be made.

The combined beneficiary data set included individual-level medical claims dates of service, reimbursement amount, provider information, and demographic information (zip code, sex, race, and date of birth). These data included each dual’s Medicare and Medicaid eligibility and program participation, such as monthly entitlement indicators and monthly participation in the HCBS. The CMS provided a key crosswalk file, linking the unique social security number of duals included in the MDCH data warehouse to the unique beneficiary identification code present in the Medicare data.

Definitions: dual status, long-term care, care settings, service types. Similar to one earlier study, the beneficiaries in these analyses were defined as duals each year if they were documented as meeting both Medicaid and Medicare eligibility in the same month, for at least one month during the calendar year (Moon, et al., 2006).

Placement into an institutional LTC care setting was defined as Level of Care Code 2 in the Medicaid eligibility data during three or more consecutive months of a calendar year (Yip,
Nishita, Crimmins, & Wilber, 2007). A beneficiary was considered to be a HCBS waiver program participant receiving LTC services if an LTC coverage code was present in at least three consecutive months of the calendar year. All others duals were considered to be community-dwelling beneficiaries not in long-term care.

Nursing home room and board represented the institutional LTC service type in our analyses. Community LTC services included HCBS waiver services, home health care, hospice care, adult foster care, skilled nursing therapies, and home help. The remaining service types were grouped together as other services. We relied on provider and claim types to further categorize services into hospital, physician, and pharmacy.

Analyses. Our analyses were based on demographic data reported on the Medicare health claims and approved reimbursement amounts documented in the Medicaid and Medicare claims. The descriptive table presents counts, percentages, and demographic characteristics of all individual beneficiaries regardless of the number of months eligible in a calendar year. All remaining analyses reporting beneficiary counts and expenditures relied on full-year-equivalent beneficiaries dividing total number of months of dual eligibility in a year by 12, in order to have comparable study units.

Monthly expenditures were presented as per-member-per-month (PMPM) averages to account for the fact that some beneficiaries were eligible fewer than 12 months of the year. All dual expenditures were presented in 2006 dollars for meaningful comparisons between years (2005 amounts were adjusted for inflation). Analyses were completed using Stata 10.0 (StataCorp. 2007) and SAS 9.2 (SAS Institute Inc. 2009) data analysis software programs.
Results

Duals in Michigan: During both 2005 and 2006, there were close to 1.6 million individual beneficiaries in Michigan covered by Medicare, with about 15% dually-eligible for both Medicare and Medicaid. The mean age of Michigan duals was 63 years, while Medicare-only beneficiaries had a mean age of 73. Over 52% of the duals were aged 65 or older, while 83% of the Medicare-only enrollees were in that age group. Approximately 25% of the duals were African-American, compared to only 9.5% among the Medicare-only beneficiaries (see Table 1).
Table 1
Medicare data 2005-2006 – Characteristics of Dually Eligible Beneficiaries (DEB) vs. Medicare-Only Beneficiaries (MOB) in Michigan

<table>
<thead>
<tr>
<th></th>
<th>All 2005</th>
<th>All 2006</th>
<th>Medicare-only 2005</th>
<th>Medicare-only 2006</th>
<th>Dually eligible 2005</th>
<th>Dually eligible 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>1,578,299</td>
<td>1,599,117</td>
<td>1,337,430</td>
<td>1,349,885</td>
<td>240,869</td>
<td>249,232</td>
</tr>
<tr>
<td><strong>%</strong></td>
<td>100%</td>
<td>100%</td>
<td>84.7%</td>
<td>84.4%</td>
<td>15.3%</td>
<td>15.6%</td>
</tr>
<tr>
<td><strong>Age mean</strong></td>
<td>71</td>
<td>71</td>
<td>73</td>
<td>73</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td><strong>Age&lt;35</strong></td>
<td>26503</td>
<td>25891</td>
<td>7272</td>
<td>6,588</td>
<td>19,231</td>
<td>19,303</td>
</tr>
<tr>
<td><strong>Age 35-44</strong></td>
<td>46428</td>
<td>45358</td>
<td>18147</td>
<td>16,810</td>
<td>28281</td>
<td>28,548</td>
</tr>
<tr>
<td><strong>Age 45-54</strong></td>
<td>84850</td>
<td>86453</td>
<td>48314</td>
<td>46,872</td>
<td>36536</td>
<td>39,581</td>
</tr>
<tr>
<td><strong>Age 55-64</strong></td>
<td>111226</td>
<td>117307</td>
<td>82148</td>
<td>85,392</td>
<td>29078</td>
<td>31,915</td>
</tr>
<tr>
<td><strong>Age&gt;=65</strong></td>
<td>1309292</td>
<td>1324108</td>
<td>118154</td>
<td>1,194,223</td>
<td>127743</td>
<td>129,885</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>883,064</td>
<td>891,968</td>
<td>733,429</td>
<td>737,911</td>
<td>149,635</td>
<td>154,057</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>1,356,432</td>
<td>1,373,876</td>
<td>1,188,891</td>
<td>1,200,474</td>
<td>167,541</td>
<td>173,402</td>
</tr>
<tr>
<td><strong>Asian</strong></td>
<td>7,701</td>
<td>8,340</td>
<td>3,577</td>
<td>3,849</td>
<td>4,142</td>
<td>4,491</td>
</tr>
<tr>
<td><strong>African-American</strong></td>
<td>188,073</td>
<td>191,279</td>
<td>127,263</td>
<td>128,005</td>
<td>60,810</td>
<td>63,274</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td>5,521</td>
<td>5,736</td>
<td>3,049</td>
<td>3,023</td>
<td>2472</td>
<td>2,713</td>
</tr>
<tr>
<td><strong>Native American</strong></td>
<td>4,438</td>
<td>4,537</td>
<td>3,132</td>
<td>3,172</td>
<td>1,306</td>
<td>1,365</td>
</tr>
<tr>
<td><strong>Notes:</strong> Full-year-equivalent beneficiary counts are presented (total number of beneficiary months divided by 12) Except for mean age, all outcomes are counts and within-column percentage in parenthesis.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: Medicare beneficiary summary 2005 and 2006, linked to Medicaid eligibility data from the Michigan Department of Community Health

Medicare and Medicaid paid combined FFS health expenditures of $14.2 billion in 2005, increasing to $14.8 billion in 2006 for the approximately 1.6 million beneficiaries. The approximately 13% full-year-equivalent duals accounted for 33% all Medicaid and Medicare expenditures on this population in 2005 ($4.7 billion) and in 2006 ($4.8 billion).
Elderly duals. Among the 1.3 million beneficiaries aged 65 or over, eight percent were dual eligibles in 2005, accounting for 26% of the public health expenditures in the aged population (see Figure 1). Also as seen in Figure 1, among the younger beneficiaries, the 36.5% duals accounted for 64% of the expenditures in 2005.

Figure 1
Dually eligibles vs. Medicare-only beneficiaries, by age (elderly compared to <65 years of age): beneficiary counts and share of public expenditures
The average PMPM expenditures in 2005 were $2,329 for an elderly dual and $1,326 for a dual younger than 65 (see Figure 2). Reporting on the mix of services, 34% of the overall elderly duals expenditures in 2005 were on institutional LTC services, while only six percent of the younger duals’ expenditures represented institutional LTC (Figure 2). The mix of services was similar in 2006 (Figure 2).

**Figure 2**
Combined Medicare and Medicaid Spending PMPM, By Service for Dually Eligible Elderly Beneficiaries Compared With Dually Eligible Adults With Disabilities:

**2005**

**Dually Eligible Elderly Beneficiaries**
$2,329

- 38% Institutional LTC Services, $894
- 34% Community LTC Services, $786
- 28% Other Services, $649

**Dually Eligible Younger Than 65**
$1,326

- 6% Institutional LTC Services, $81
- 25% Community LTC Services, $333
- 69% Other Services, $912

**2006**

**Dually Eligible Elderly Beneficiaries**
$2,388

- 40% Institutional LTC Services, $941
- 32% Community LTC Services, $775
- 28% Other Services, $672

**Dually Eligible Younger Than 65**
$1,368

- 6% Institutional LTC Services, $78
- 26% Community LTC Services, $348
- 68% Other Services, $942
While the average PMPM expenditures of the elderly duals were $2,329 in 2005, there were considerable variations by care setting: $4,896 for the elderly duals in institutional LTC, $2,921 for the elderly duals in LTC served through the HCBS waiver program, and $1,488 for other elderly duals residing in the community. Approximately 23% of the dual elderly in 2005 were served in institutional LTC care settings, accounting for 47% of the group’s expenditures. These unreported results are available from the authors.

Elderly duals in long-term care. The monthly nursing facility expenditures of elderly duals receiving their LTC in institutional care settings were stable at $3,440 in 2005 and $3,444 in 2006 (Figure 3). Medicaid and Medicare also paid, on average, $769 a month for hospital services and $758 on HCBS waiver services in 2005 for each elderly dual in LTC cared for at home or in the community through the Michigan MI Choice waiver program. The monthly average amounts for 2006 were $747 and $854 respectively (Figure 3). The monthly hospital expenditures of those in institutional LTC increased from $512 to $641 (Figure 3). In both care settings, the pharmacy expenditures increased in 2006 (Figure 3).
Figure 3
Per Month Medicaid and Medicare Spending for Elderly duals in Long Term Care by Service Type and Care Setting
Discussion

There were close to 1.6 million Michigan individuals each year in 2005 and 2006 covered in part or fully by Medicare. Approximately 16%, almost 250,000 in 2006, were dually insured by both Medicaid and Medicare. The percentage of duals among the entire Medicare population was smaller in Michigan than the 21% estimated from the overall 2011 US population (Kaiser Commission on Medicaid Facts, 2011; Kaiser Family Foundation, 2011).

Over half of the dual population in Michigan were aged 65 or over, while the remaining duals were younger disabled individuals. There was a higher percentage of women duals compared to the Medicare-only beneficiaries, likely a sign of the persistent overall gender gap in income and the fact that Medicaid eligibility is mainly income-based (Kaiser Commission on Medicaid Facts, 2011). Minorities, in particular African-Americans, were also over-represented among the duals compared to Medicare-only beneficiaries, reflecting similar income disparities. Hispanic, Asian, and Native American were also more frequent among duals compared to Medicare-only beneficiaries.

Similar to results seen in other states and nationally, (MedPAC, 2010b; Massachusetts Medicaid Policy Institute, 2012) the Michigan duals accounted for a disproportionate share of the public healthcare service expenditures, comprising approximately one-seventh of all Medicare beneficiaries but accruing approximately a third of total expenditures. This concentrated use of resources was even more pronounced among the elderly duals, representing less than one tenth of beneficiaries but accounted for over a quarter of all expenditures. When comparing all duals with Medicare-only beneficiaries, the ratio of expenditures share to beneficiary share was more than 3-to-1 among elderly duals and less than 2-to-1 among younger disabled duals. These findings support earlier work showing that the duals tend to be sicker, poorer and more costly
compared to Medicare-only beneficiaries (Moon & Shin, 2006; Kaiser Commission on Medicaid Facts, 2011; Center for Health Care Strategies, 2010a; Center for Health Care Strategies, 2010b; MedPAC, 2010a).

Elderly duals institutionalized in Michigan LTC settings were especially costly, totaling over $1.7 billion in 2006, amounting to 55% of total state Medicaid expenditures based on the authors’ calculations. The LTC elderly duals in home and community-based settings (HCBS) were served at 60% the monthly per beneficiary cost of the institutional LTC elderly duals. Notably, a small proportion (i.e. approximately 6%) of eligible elderly Michigan duals actually received LTC services through the HCBS waiver, with approximately one quarter of all elderly duals residing in nursing homes at much higher costs. This represents a clear area for potential cost savings for nursing home eligible duals who may prefer to stay at home and receive LTC services through such waiver programs (Center for Health Care Strategies, 2010a; Center for Health Care Strategies, 2010b; MedPAC, 2010a; Department of Health and Human Services, 2012b).

The expenditure variations by age, service type and care setting reflect the heterogeneity in health status and needs as well as the types of services preferred and required by different types of duals. They also reveal the difficulty of disentangling types of services and sources of payment for the dual beneficiaries. For example, the elderly nursing home duals had lower expenditures on hospital and physician services compared to the HCBS elderly duals, consistent with prior literature. In addition, the difference in expenditures on nursing home services is higher than the overall difference in expenditure between the two groups of beneficiaries.

These results suggest that, while the nursing home room and board was the main driver of the higher monthly beneficiary expenditures of the elderly in institutional LTC, other services
may have been provided by the nursing homes and likely included in the overall nursing home rate. Nursing home room and board was by far the largest LTC expenditure for elderly duals and was the main driver of the higher monthly beneficiary expenditures of the elderly in institutional LTC compared to elderly in home or community-based LTC.

Medicaid’s share of the duals expenditures decreased in 2006 as the prescription drugs coverage for the duals shifted to Medicare. The duals total per beneficiary expenditures remained unchanged in 2006 compared to 2005. Elderly duals in LTC increased their expenditures in 2006 compared to 2005 in nearly all service categories. The notable exception was the most expensive service category, the nursing facility charges, which did not change. This was not surprising, as the room and board rates remained virtually constant. The monthly prescription drug expenditures increased in 2006 by 24% for duals living in nursing homes and by 30% for duals receiving home-based-care. Their total monthly expenditures were affected to a lesser extent as the prescription drugs represented a small share of overall costs. Among elderly duals, the monthly expenditures of those in institutional LTC and in the home-based LTC waiver program increased by only 6% in 2006, while the other elderly duals not in LTC actually decreased their expenditures by 11% compared to 2005.

These analyses were subject to several limitations that should be considered for future work in this area. First the authors were only able to analyze the expenditure patterns of FFS duals. However, the Kaiser Family Foundation reported that only 1.4% of national duals were enrolled in Medicare Advantage Plans in 2005 and 5.5% in 2006 (Henry J. Kaiser Family Foundation, 2012). The managed care penetration among duals in Michigan at the time was similarly estimated to be between only 4% and 6% (unpublished estimation from contributor Thomas McRae). Second, the authors were limited by the inherent limitations found in claims
data, including the fact that the expenditures were not adjusted to reflect spending not tied to provider claims, or to reflect financial adjustments that were not reflected in the claims data (Saucier, et al., 1998).

Using data from the entire population of Michigan duals, we confirmed the findings in other states, and nationally, that duals accounted for a disproportionate large share of state and federal health expenditures. While the change in the prescription drug coverage of the duals from Medicaid to Medicare increased the drug expenditures for some duals, it had limited impact on the overall dual expenditures. Those duals who were younger than 65 were less expensive to serve than the elderly duals, mostly because they consumed fewer institutional LTC services. Michigan’s experience suggests that LTC services can be offered in home and community-based settings, at lower costs compared to institutional LTC. The increasing numbers of elderly and/or disabled lower-income duals will likely put additional pressure on policymakers attempting to creatively develop targeted cost-effective programs (Center for Health Care Strategies, 2010a; MedPAC, 2010B; Massachusetts Medicaid Policy Institute, 2012. In order to reduce care fragmentation, provide improved, more patient-centered care, and reduce costs, states began integrating Medicaid and Medicare services available to duals. Serving more elderly with LTC needs in home and community-based settings through Medicaid waiver programs seems to be an additional opportunity to reduce costs while accommodating the beneficiary preferences.

**Contributors:**

Charles Mundt, Robert Stampfly, ThomasMcRae at the Michigan State University Institute for Health Policy.
Acknowledgements:

This project was, in part, supported by funds received from the State of Michigan, Michigan Department of Community Health (MDCH, contract number 20090000). The analyses, interpretations, and conclusions are the responsibility of the authors and do not necessarily represent the official views of the State of Michigan or MDCH.
References


http://www.chcs.org/publications3960/publications_show.htm?doc_id=1186550

Center for Health Care Strategies. (2010b) *Integrating Medicare and Medicaid data to support improved care for dual eligibles*. (technical report). Retrieved from:


StataCorp. (2007). Stata Statistical Software: Release 10. College Station, TX: StataCorp LP.


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.
The MDCH SHARP MRSA/CDI Prevention Initiative: A Cost Analysis

Noreen Mollon, MS, Bryan Buckley, MPH, Gail Denkins, RN, BS, and Jennie Finks, DVM, MVPH

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 (SNF). The acute care facilities submitted 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: 080.45 Clostridium difficile; 038.12 S. aureus sepsis; 482.42 S. aureus pneumonia and 494.12 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 (2012).

<table>
<thead>
<tr>
<th>Healthcare-Associated Infection Type</th>
<th>ICD-9 Code</th>
<th>Cost, $ (Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant Staphylococcus aureus (MRSA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S. aureus sepsis</td>
<td>038.12</td>
<td>$25,880</td>
</tr>
<tr>
<td>S. aureus pneumonia</td>
<td>482.42</td>
<td>$17,990</td>
</tr>
<tr>
<td>Other S. aureus infections</td>
<td>494.12</td>
<td>$19,100</td>
</tr>
</tbody>
</table>

Cases were classified as Healthcare-Associated Onset (HAO) and Community-Onset (COO) in accordance with NHSN definitions. HAO is defined as having the positive specimen collected ≥3 days after admission to the facility. COO is defined as having the positive specimen collected ≤3 days after admission to the facility.

Results
The majority of acute care MRSA and CDI events were HAOS, with 63.4% and 56.8% respectively, while the majority of SNF events were COOS, with 59.7% and 59.7% respectively. Acute care facilities incurred $11,025,300 in MRSA-associated costs while skilled nursing facilities incurred $430,600. Acute care facilities incurred costs of $10,371,200 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 HAIs 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.
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.

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.

- Denotes prevalence differences that depart from the null (p < 0.05)
- Data from the merged NHANES 2001-10, except for marijuana and sleep duration where data was only available for the survey year 2005-10

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 across 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. Anthony provided valuable advice about power presentation.

Grant Support

MSU (RB, OA); K05DA015799 (JCA).