Session 74PD, Public Health: More Important Now Than Ever

**Moderator/Presenter:**
John I. Mange, FSA, MAAA

**Presenters:**
Lisa Macon Harrison, MPH
Jason W. McKinley, FSA
Sara C. Teppema, FSA, FCA, MAAA
2018 SOA Health Meeting

PUBLIC HEALTH TASK FORCE
Session 74, Public Health: More Important Now Than Ever
June 26, 2018
Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- **Do not** discuss prices for services or products or anything else that might affect prices.
- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions.
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone’s responsibility; however, please seek legal counsel if you have any questions or concerns.
Presentation Disclaimer

Presentations are intended for educational purposes only and do not replace independent professional judgment. Statements of fact and opinions expressed are those of the participants individually and, unless expressly stated to the contrary, are not the opinion or position of the Society of Actuaries, its cosponsors or its committees. The Society of Actuaries does not endorse or approve, and assumes no responsibility for, the content, accuracy or completeness of the information presented. Attendees should note that the sessions are audio-recorded and may be published in various media, including print, audio and video formats without further notice.
Public Health Task Force

• Mission: Educate actuaries on the growing importance of public health; connect actuaries with opportunities to contribute to public health

• Outcomes
  • Health Watch articles; Health Meeting sessions
  • Actuarial Basic Education
  • Task Force members offered input to Healthy People 2030
  • The Actuary Public Health Web Exclusive

http://www.theactuariymagazine.org/category/web-exclusives/public-health/
Polling: What one or two words come to mind when you hear the phrase “public Health?”
Public Health Evolution

• Public Health 1.0: Targeted interventions
• Public Health 2.0: Complex integrated system focused on assessment, assurance, and policy development
• Public Health 3.0: Social determinants of health
Match the following items to Public Health 1.0, 2.0, and 3.0: A. Family Planning; B. Suicide Prevention; C. Lead Paint Exposure.
Presenters

• Sara Teppema, FSA, MAAA
• Jason McKinley, FSA
• Lisa Macon Harrison, MPH
Family Planning is a Public Health Issue

SARA C. TEPPEMA, FSA, MAAA
What percentage of pregnancies in the US are unintended?

- About 25%
- About 35% (45%)
- About 45% (40%)
- About 55% (14%)
Why are we talking about family planning?

The availability of family planning services allows individuals to achieve desired birth spacing and family size, and contributes to improved health outcomes for infants, children, women, and families.

It’s also a CDC 6|18 prevention initiative!
The CDC’s 6|18 Initiative: 6 Common and Costly conditions and 18 interventions

Without public funding for family planning services, the numbers and rates of unintended pregnancies and abortions in the United States could be nearly 50% higher than current levels.

Payers may generate health care cost savings and can reduce contraceptive non-adherence by increasing patients’ access to the use of LARC.
What portion of births in the US are paid for by government entities (e.g., Medicaid, Indian Health)?

- About a quarter: 8%
- About a third: 45%
- About half: 47%
**UNINTENDED PREGNANCY RATES**

Between 1981 and 2011, unintended pregnancy has become increasingly concentrated among poor and low-income women.

Rate (per 1,000 women aged 15–44)

- <100% of poverty
- 100-199% of poverty
- All women
- ≥200% of poverty

www.guttmacher.org
Close cousin is maternal and infant health

• In the news: Racial health disparities for new mothers and babies
• Also in the news: the importance of prenatal and postpartum care on the long term health of the mom and baby
• When women can effectively plan their births they may be better able to time pregnancy for better outcomes
What do you think of when you hear the term "LARC?"

- Enjoying oneself by behaving in a playful and mischievous way: 21%
- An amphibious military cargo vehicle: 5%
- A bird whose song is eloquently captured in Vaughan Williams’ piece for violin and orchestra: 2%
- Long-acting reversible contraceptive: 71%
Why are we talking about LARCs?

- They have failure rates that are a fraction of those for other forms of birth control, especially for adolescents
- Their use has grown over the past 10-15 years, as safety concerns were addressed
Why are we talking about LARCs?

- Research on existing programs has shown significant declines in unintended pregnancies as a result of LARC use.

- **St. Louis CHOICE project:** Enrolled women avoiding pregnancy.
  - 75% LARC selection;
  - Teen pregnancy rate **one-fifth of the national average** 2007 through 2011.

- **Gaston County, NC:** Provider training and funding for the uninsured.
  - Rate of teen pregnancy **dropped 45%** between 2010 and 2015.

- **Iowa (statewide):** Funding to family planning agencies.
  - LARC usage increased from **1% to 15%** from 2007 to 2012.
Why aren’t we talking MORE about LARCs?

- Although their use is growing, many patients and even clinicians have not yet been fully educated on their safety and benefits
  - Only about half of obstetrician-gynecologists offer patients the option of a hormonal implant
  - Less than half of women in a recent study knew of the effectiveness of IUDs and implants
- The ACA and Medicaid require that insurers offer contraception at no cost to members
  - Despite this, some plans still may not cover specific IUDs or implants without cost sharing
## Illustration of cost-benefit of LARCs

<table>
<thead>
<tr>
<th></th>
<th>IUD</th>
<th>Pill</th>
<th>Condoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contraception Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three-year cost</td>
<td>$1,009</td>
<td>$720</td>
<td>$360</td>
</tr>
<tr>
<td>Cost PMPM for women using contraception</td>
<td>$28.03</td>
<td>$20.00</td>
<td>$10.00</td>
</tr>
<tr>
<td><strong>Cost of Contraception Failure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual contraception failure rate</td>
<td>1%</td>
<td>9%</td>
<td>18%</td>
</tr>
<tr>
<td>Percentage of unintended pregnancies carried to term</td>
<td>58%</td>
<td>58%</td>
<td>58%</td>
</tr>
<tr>
<td>Maternity and delivery costs</td>
<td>$13,430</td>
<td>$13,430</td>
<td>$13,430</td>
</tr>
<tr>
<td>Maternity and delivery cost PMPM per woman using contraception</td>
<td>$6.49</td>
<td>$58.42</td>
<td>$116.84</td>
</tr>
</tbody>
</table>
Illustration of cost-benefit of LARCs (continued)

<table>
<thead>
<tr>
<th>Net Cost of Contraception</th>
<th>IUD</th>
<th>Pill</th>
<th>Condoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraception cost PMPM</td>
<td>$28.03</td>
<td>$20.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>Maternity and delivery costs PMPM</td>
<td>$6.49</td>
<td>$58.42</td>
<td>$116.84</td>
</tr>
<tr>
<td>Total cost PMPM per woman using contraception</td>
<td>$34.52</td>
<td>$78.42</td>
<td>$126.84</td>
</tr>
<tr>
<td>Savings from IUD use over using oral contraception</td>
<td>($43.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savings from IUD use over using condoms</td>
<td></td>
<td></td>
<td>($92.32)</td>
</tr>
</tbody>
</table>
### Illustration of cost-benefit of LARCs (continued)

<table>
<thead>
<tr>
<th>Annual Savings for Example Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed population using contraception</td>
</tr>
<tr>
<td>Assumed portion of the population using oral contraceptives</td>
</tr>
<tr>
<td>Assumed portion of the population using condoms</td>
</tr>
<tr>
<td>Potential upper bound savings from IUD use over other methods</td>
</tr>
</tbody>
</table>
References

References and notes to calculations can be found in the web-exclusive issue of The Actuary devoted to public health.

Web-Exclusive:
http://www.theactuarymagazine.org/category/web-exclusives/public-health/

Unintended pregnancy article:
http://www.theactuarymagazine.org/preventing-unintended-pregnancy/
Can we leverage our tools to save lives?

Jason McKinley FSA
Associate Actuary

June 26, 2018
How do we think about suicide?

Fight Mental Health Stigma*

- Talk openly about mental health
- Be conscious of language
- Encourage equality between physical and mental illness
- Educate yourself and others
- Be honest about treatment

Scope of the Problem

A Life Insurance Perspective
A Human Problem

Elucidated with numbers

<table>
<thead>
<tr>
<th>CDC Data</th>
<th>Societal Pain</th>
<th>Family Pain</th>
</tr>
</thead>
</table>
| ▪ Suicide is still the 10th leading cause of death in the U.S.  
  • 44,965 in 2016  
  • One of three in the top 10 trending worse instead of better | ▪ For every death by suicide, 11-12 times that number have taken non-fatal suicidal actions  
  • These actions often end in disability or permanent impairment | ▪ About one in 64 Americans has lost an immediate family member to suicide  
  • About one third of Americans surveyed say their life has been personally affected by suicide |

*The cost of one suicide is estimated at over $1.3 million dollars*

Data Analyses

- Trends and cultural fluctuations
  - The numbers are movable

- U.S. life policyholders:
  - Identifying policyholders at risk
    - Suicides and mental illness in the insured population
  - Times of increased risk for policyholders
    - Economic hardship and suicide
    - The impact of the contestability period
Trends and Cultural Fluctuations

The numbers can move dramatically in a short period of time

United States age-adjusted suicide rates, 1990-2015

Select country age-adjusted suicide rates, 1990-2015

Death Rate per 100,000 Lives


Death Rate per 100,000 Lives


- United States
- South Korea
- Netherlands

Identifying Policyholders at Risk

Policyholders who died by suicide were almost three times as likely to have a mental illness impairment than similar people with a different impairment set.

Case Control Study

- Match policyholders who died by suicide with otherwise similar policyholders who did not
  - Match age, gender, smoking status
  - Match on underwriting evidence used in decision
  - Match on overall mortality expectation
- Look for mental health impairment in both groups
- Results in odds ratios

Odds ratios and 95% confidence intervals for odds that policyholders who died by suicide had a mental illness impairment at underwriting

- Males
- Females
- Ages below 35
- Age 35-44
- Ages 45+
- Preferred NS
- Standard NS
- Smokers
- Face amount up to $100K
- Between $100K and $500K
- $500,000+

Odds Ratio (Log 2 scale)
- Interquartile range; vertical line is median odds ratio
Increased Risk: Economic Hardship

The insured population appeared to be especially impacted by the recession.

**Economic Hardship/Anxiety**

- Many potential measures
  - Unemployment
  - Gross domestic product
  - Annual jobs added
  - Economic Anxiety Index (since 2015)

- The first three tell roughly the same story; Economic Anxiety Index is too new to test.

**Age-adjusted rates of suicide per 100,000 lives**

Increased Risk: The Contestability Period

Suicides spike as the contestability period ends, and remain elevated beyond

**Contestability Period**

- Claims are not typically paid on suicides that occur in the contestability period
- For most companies and states that is the first two policy years
- Suicides as a percent of all deaths nearly doubles from the percent in the month after the contestability period ends
What is possible?

A very brief aside
Issues to Consider

The Four R’s

- Regulations
  - HIPAA, GDPR

- Reasonable expectations

- Risks
  - Reputational damage
  - Financial penalties for misuse of data

- Rewards
  - Saving lives
  - Helping families
What tools do we have?
Tools for identifying people at risk

- Life Underwriting Data
  - Point-in-time and historical health data at application
  - Other mortality rating factors
  - Few post-issue data opportunities

- Health Claims
  - ICD-10 codes
  - Prescriptions
  - Mostly post-issue data opportunities

- Other Possibilities
  - Genetic data
  - ACES
  - Data modeling

*Not at all exhaustive!*
Possible Initiatives
Prevention and Outreach

- Prevention for people at risk
  - Identify people at risk
    - Impairment or ICD-10 codes combined with
      - Time frame within the contestability period
      - Economic conditions
  - Caring communications have shown promise*

- Outreach to surviving family members
  - Provide useful information on mental health services available to the survivors
    - May even be beneficial in some cases for prevention

Moral Imperative

If you believe you can positively impact these problems, do you have a moral obligation to do so?
Suicide Prevention Resource

- https://suicidepreventionlifeline.org
Public Health

Funding the Long Game

“Saving Money and Improving Health”

Lisa Macon Harrison, MPH, Local Public Health Director

GRANVILLE VANCE public health
Public health works every day to promote and protect health, and prevent disease. Overall, Local Health Departments are the only community entities concerned with protecting the health of the entire community...advocating for and promoting health in its broadest form.
Americans should expect basic health protections no matter where they live, but funding varies greatly across the nation’s 2,862 local health departments.

So what exactly is the public health system made up of across the US and how is it currently funded?

Common language and definition of what public health does:

- **10 Essential Services and 3 Core Functions**
- **Chief Health Strategist in the Community**
- **Foundational Capabilities:**

Protecting the Public, Cultivating Leadership, Building New Models, Demonstrating Accountability, Mobilizing the Community, Forging Partnerships, Communicating with the Public, Using Integrated Data Sets, Assessment, Assurance, and Policy Development, Improved Surveillance, Epidemiology, Integrated Care, and Lab Capacity
How do we become more comfortable with, and patient with, Return on Investment in public health taking decades or generations?

What is the long game?

“Considering the future implications of current choices, thinking ahead, being deliberate and patient.” Setting goals.

Play the long game.

Think beyond optimizing for the here and now; it’s about cultivating long-term value.

-Urban Dictionary

Return on Investment (ROI) in Public Health

“According to CDC, most infectious diseases and a majority of chronic diseases could be prevented — sparing millions unnecessary suffering and saving billions in healthcare costs.

...An analysis by the Trust for America’s Health (TFAH) found that an investment of $10 per person per year in proven evidenced-based community prevention programs that increase physical activity, improve nutrition and prevent smoking and other tobacco use could save the country more than $16 billion annually within five years — a return of $5.60 for every $1 invested.”

-Investing in America’s Health: A State-by-State Look at Key Funding and Key Facts
Trust for America’s Health (TFAH) healthyamericans.org April 2016.
A Resilient Public Health System is more than just the sum of its parts, but to date, in the US, we have funded mainly just parts.

“... the vast majority of government health spending in the United States is for individual illness care and treatment for disease; a far smaller and inadequate proportion is provided, ineffectively, to support governmental public health’s efforts to improve population health. The current financing system for health in the United States is profoundly misaligned.”

—National Academy of Sciences
Piecing it together well relies on a strong foundation

Funding for public health today is cobbled together at federal, state and local levels with a diverse and ephemeral stream of program-oriented dollars attached to expectations and deliverables that form, in one way of looking at it, a game of Jenga.
Visual Interpretation of LHD Budgets in NC
Public Health Systems and Services

In a special issue of the journal *Health Services Research*, Dr. Douglas Scutchfield summarized a consensus definition of Public Health Systems Research (PHSR):

- Public Health Systems Research (PHSR) is a field of study that examines the organization, financing and delivery of public health services within communities and their impact;
- PHSR is a multi-disciplinary field of study that recognizes and investigates system level properties and outcomes … and how their interactions affect organizations, communities, environments, and population health status;
- The term ‘services’ broadly includes programs, direct services, policies, laws, regulations designed to protect and promote the public’s health and prevent disease and disability at the population level.

“Sustainability and resiliency of the public health system and its funding is not automatic.” (Glen Mays)
**Required local public health services in NC include:**

<table>
<thead>
<tr>
<th>Provide:</th>
<th>Provide/contract/certify:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food, lodging &amp; institutional sanitation</td>
<td>Adult health</td>
</tr>
<tr>
<td>Individual on-site water supply</td>
<td>Home health</td>
</tr>
<tr>
<td>Sanitary sewage collection, treatment &amp; disposal</td>
<td>Dental public health</td>
</tr>
<tr>
<td>Communicable disease control</td>
<td>HIV/STD</td>
</tr>
<tr>
<td>Vital records registration</td>
<td>Maternal health</td>
</tr>
<tr>
<td></td>
<td>Child health</td>
</tr>
<tr>
<td></td>
<td>Family planning</td>
</tr>
<tr>
<td></td>
<td>Public health laboratory</td>
</tr>
</tbody>
</table>

*These required services do not even touch on the basic Community Health Assessment or Health Education and Health Promotion needs within a community. Moving forward, the work of the LHD as a community health strategist for public health 3.0 will require addressing determinants of health and connecting partners.*
Critical System Component: The Public Health Workforce

- Administrators / Finance Officers / HR Directors
- Dentists / Hygienists / Dental Assistants
- Doctors & Mid-level Providers
- Environmental Health Scientists
- Epidemiologists
- Evaluators
- Health Educators & Community Health Workers
- Lab Technologists
- Management Support Staff
- Nutritionists
- Psychologists
- Researchers
- Social Workers
- Translators
- Actuaries...
Example: 2018 GVPH Revenues and Expenses

Revenues 2017: $5,984,265
Revenues 2016: $5,300,593

Green = County Appropriations (19% 16%)
Blue = Federal and State Funding (36% 38%)
Orange = Service Fees and Medicaid (27% 32%)
Purple = “Other revenue” (Grants) (18% 14%)

Expenses 2017: $6,072,389
Expenses 2016: $5,968,541

Green = Administration (10% 10%)
Blue = Environmental Health (10% 11%)
Orange = Home Health (now sold) (18% 19%)
Purple = Other Human Services (62% 60%)
### Granville-Vance Public Health Budget

#### Unpredictable & Declining Federal and State Funding

<table>
<thead>
<tr>
<th>Fund Balance</th>
<th>Total Local</th>
<th>Env Health Fees</th>
<th>Medicaid</th>
<th>DHHS/State</th>
<th>Medicare</th>
<th>Fees, Insurance, &amp; Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY13</td>
<td>12.89%</td>
<td>11.41%</td>
<td>3.56%</td>
<td>18.81%</td>
<td>31.07%</td>
<td>14.56%</td>
</tr>
<tr>
<td>FY14</td>
<td>18.33%</td>
<td>12.95%</td>
<td>3.15%</td>
<td>17.96%</td>
<td>26.87%</td>
<td>11.00%</td>
</tr>
<tr>
<td>FY15</td>
<td>8.78%</td>
<td>10.74%</td>
<td>4.24%</td>
<td>20.65%</td>
<td>25.92%</td>
<td>9.89%</td>
</tr>
<tr>
<td>FY16</td>
<td>11.43%</td>
<td>14.22%</td>
<td>5.37%</td>
<td>18.67%</td>
<td>30.55%</td>
<td>8.35%</td>
</tr>
<tr>
<td>FY17</td>
<td>6.16%</td>
<td>14.26%</td>
<td>4.30%</td>
<td>17.27%</td>
<td>25.70%</td>
<td>9.01%</td>
</tr>
</tbody>
</table>

FY17 calculations do not include one time funding from each county.

One time $550,000 CON Settlement
Today, the demands on the public health system are greater than ever. Health of a community drives the economy. Poor community health translates into a reduction in community growth, loss of existing or future industry, and ultimately reduced tax revenue.

Each level of government has different but important responsibilities for protecting the public’s health. Unpredictable and steadily decreasing federal and state funds puts our local public health system at risk.
NC Ranks #44 out of the 50 states in public health per capita state spending

The 2016 Trust for America’s Health (TFAH) report puts NC at # 44 out of 51 (states and the District of Columbia) for state public health funding levels which reflects a $14.30 investment per person.

- The median for comparison is $35.77 in South Dakota
- Hawaii at $158.11 is #1 per capita investment
- Nevada at $4.10 is #51 per capita investment

Note: Rankings include Washington DC for a total of 51 data points.

Source: TFAH analysis 2016. For a detailed methodology, see “Investing in America’s Health” at www.healthyamericans.org and http://www.healthyamericans.org/states/
Future Opportunities: Engage Others...e.g., Actuaries
“The health of the people is really the foundation upon which all their happiness and all their powers as a state depend.” -Benjamin Disraeli
Thank you for supporting our efforts to improve community health and wellness.

Lisa Macon Harrison
919-693-2108
lharrison@gvdhd.org

Granville Vance Public Health
lharrison@gvdhd.org