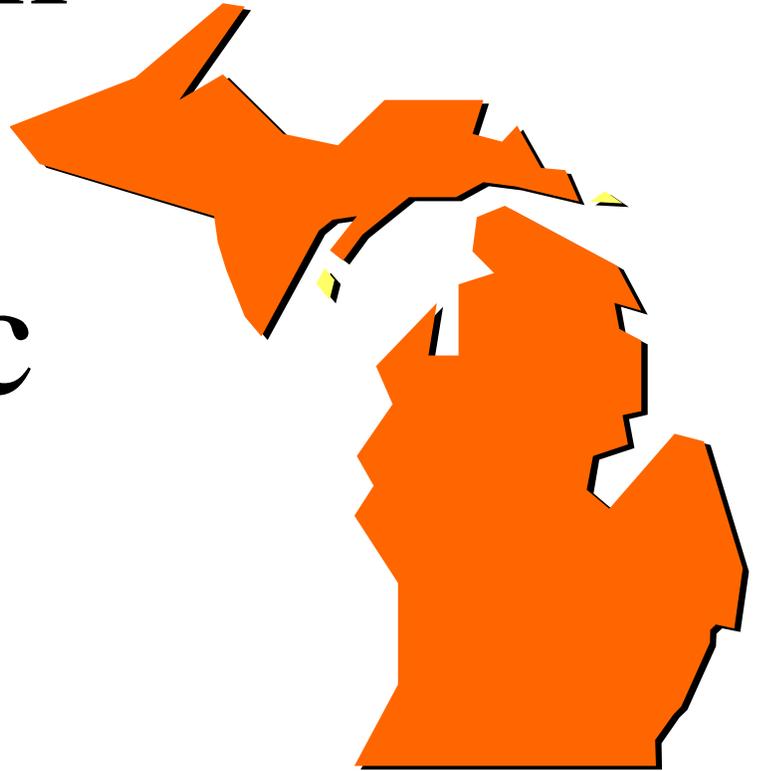


# Michigan Journal of Public Health



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## **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 three year terms.



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# 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.

## **SUBMISSION CATEGORIES:**

**Research and Practice Articles** (up to 15 pages or 3500 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 or 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 1,200 words) are solicited based on recommendations from the Editorial Board, or members of MPHA. All recommendations require approval from the MJPH Editorial Board.

**Invited editorials do not necessarily reflect the views of the Editorial Board or of the Michigan Public Health Association.**

**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.

## **SUBMISSION FORM:**

All authors must sign and submit via surface mail the submission form along with a draft article. The form is available at:

<http://www.mipha.org/PHJournal/MJPH%20MANUSCRIPT%20SUBMISSION%20FORM.pdf>



# **Notes from the Field**

“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 PH 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. So, “Notes” will often not be considered research projects.

“Notes” 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.

Authors should be aware that some information/data in Notes from the Field may require IRB and/or HIPAA review.

Submissions may be up to 750 words.

## **SUBMISSION FORMAT:**

### **“Notes”:**

Submit 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.

### **References:**

Limit references to those essential for scholarship or further follow-up by readers. Follow APA format. If the reference is not a book or an article, provide all the information that you can: page numbers, web site, e-mail address, radio show, manual, personal correspondence, videotape, and so on.

### **Resources:**

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.



**In writing please follow these prompts:**

**Title:** Write short, catchy titles that capture the reader's attention and highlight the uniqueness of the program.

**Overview:** In the first paragraph, give a brief overview of

- problem addressed;
- policy issues involved (local, state, federal, organizational);
- geographic location and the populations targeted;
- approach used to resolve the problem; and
- results obtained.

**Description:** Provide enough detailed information about the program/policy/issue to enable the reader to decide whether this effort could be replicated and what resources it would take to do so. Mention the history of the program/policy/issue and, if relevant, describe the key stages in program/policy/issue development, from acquisition of resources to current operational status. Interesting or unusual aspects of the program that merit a more detailed description, such as participant perspectives, staffing needs, volunteer training, special problems and solutions, or compelling situations may merit a more detailed description under a separate heading or as a sidebar box to the article.

**Discussion and Evaluation:** Summarize the evidence for the program/policy/issue's effectiveness. What has been most successful and most disappointing in your appraisal? What could have been done differently? What additional resources would have helped? Be explicit about funding sources and program/policy/issue costs.

**Next Steps:** Assess the viability/sustainability of the program and future challenges and opportunities. Comment on practical experiences and implications for other programs.

**Key Findings:** Use 3 or 4 bullets to highlight key outcomes and public health implications of the program. Write in lay terms easily understood by policymakers, the media, and readers outside of the field of public health.

**Send only electronic submissions to:**

Greg Cline, PhD, Editor  
clinegr@gvsu.edu



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## **EDITORIAL**

Welcome to another issue of the Michigan Journal of Public Health!

As Michigan struggles through another year of a declining economy we are pleased to report signs that public health remains a vibrant and innovative community in our state.

The MJPH Editorial board has just expanded to include additional representation from local public health and the Michigan Department of Community Health. From Macomb County we welcome Steve Gold, from Berrien County we welcome Theresa Green, and from the Michigan Department of Community Health, we welcome Violanda Grigorescu. Thanks to all who applied or otherwise helped us locate such great colleagues for our volunteer board!

We begin this issue with the advent of our newest submission category: “Notes from the Field.” “Notes” is designed with the goal of providing practitioners with an outlet for sharing information on innovations, best practices and other important activities that are not ready for a full treatment and peer review. By providing this category we hope to attract more submissions from practitioners across our state, from as broad a spectrum of public health activities as is possible.

Our Guest Editor this issue is Congressman Fred Upton representing Michigan’s 6<sup>th</sup> Congressional District in the United States’ House of Representatives. Representative Upton is a strong supporter of public health and health care in Michigan. In his guest editorial he provides us with his perspective on health care reform in our nation, and its potentials for Michigan’s citizens.

Congressman Upton is followed the second installment of our invited historical series tracing the history of public health in Michigan. Elaine Beane and Bob Mosher trace the past and remind us that some aspects of the struggles for the public’s health do not always change.

We all present two practice and research articles, one on the role of obstetrician/gynecologists in immunizations, the other exploratory research on evidenced base nurse practice in Michigan.

As always you may e-mail your comments, feedback and letters to me at [clinegr@gvsu.edu](mailto:clinegr@gvsu.edu).

Greg Cline, PhD  
MJPH Editor



**GUEST EDITORIAL**

**Michigan's Families Deserve Access to Timely,  
Affordable and the Most Up-to-Date Health Care**

Congressman Fred Upton  
United States House of Representatives

Since coming to Congress, I have been committed to ensuring that every American has access to comprehensive, affordable health care services and coverage. We have made progress toward this goal with the expansion of the Medicaid program for the poor, expanding Medicare coverage for preventive health services and prescriptions for the elderly and the disabled, creating the successful State Children's Health Insurance Program for children in working families that cannot afford insurance, and significantly expanding the community health centers program, such as the Kalamazoo family clinic or the InterCare clinics serving Berrien county, which provide a medical home and primary care services for the uninsured.

Michigan's working families are struggling mightily to provide for their families, yet for many, relief seems light-years away. During these challenging times, we must work to ensure that adequate resources are available to provide health care for our most vulnerable children.

I was pleased that the Children's Health Insurance Program Reauthorization Act of 2009 (H.R. 2) passed the House by a vote of 289 to 139 last month and was signed into law by President Obama. It has been an extremely successful program here in Michigan (MICHild) and across the nation. I was at the table in 1997 when we initially developed and enacted SCHIP in a bipartisan partnership between a Republican-controlled Congress and the Clinton Administration.

SCHIP ensures that all Michigan children have access to important care such as routine check-ups, immunizations and prescription drugs. As every parent knows, it is vital for our nation's future that we remain committed to the health and welfare of our children.

The law allows Michigan to continue striving to ensure that every child has health insurance. Particularly at a time when many people have lost their jobs and their healthcare coverage, this legislation is critical to making sure that all children have access to quality health care.

In Michigan alone, SCHIP provides health insurance to 55,000 uninsured children every month. The vote to expanding the program will ensure 4 million more children will have access to affordable health care, including up to 80,000 more children here in Michigan.

Clearly, however, we have much more to do. It is entirely unacceptable that in one of the wealthiest nations in the world, over 45 million of our fellow Americans—most of them workers or the spouses and dependents of workers—lack health insurance coverage. We need to undertake comprehensive reforms that will extend coverage to these individuals and families and rein in the spiraling increases in health care costs that are fueling this problem.



One approach to achieving universal coverage would be to go to a single-payer system such as Canada's or Great Britain's. We would have everyone covered, and the administrative savings could be significant. But as many people in Canada and Great Britain have found out, having a government-issued insurance card does not guarantee getting the care you need when you need it. Canadians and Brits often find themselves on long-waiting lists for non-emergency care. Take the situation, for example, of a 50-year-old woman in the United States with a lump in her breast. She would almost certainly undergo a biopsy in less than three weeks. In Canada, she would be lucky to be seen in less than three weeks, and more than one in five women in her situation would have to wait more than three weeks for the biopsy. Or take a 65-year-old man in the United States in need of a hip replacement. He would be in for the operation within a few months. In Canada, half of the men in his condition would be looking at waits of six months or more.

And when Canadians and Brits finally do get treated, they are less likely than U.S. patients to benefit from the latest advances in diagnostic and treatment technology. A recent study of the availability of 50 cutting-edge medical technologies at hospitals in Canada's five largest cities found that only 10 of these 50 technologies were available in more than half of the surveyed hospitals.

America, by contrast, leads the world in the development and deployment of breakthrough drugs, medical devices, and medical procedures—in large part because, unlike government-run systems with their price controls and rationing, there are strong incentives in our market-based system for innovation.

Thankfully, the prospects appear dim for the single-payer approach as the March 16<sup>th</sup> edition of *Congressional Quarterly Today* reported, "Obama dismissed the idea of a single-payer system, saying that Americans would not welcome such a dramatic change."

Another possible approach, one that has been proposed by some on the left, is the possibility of creating a "public-plan" option. I believe that this plan, if enacted, would force private plans out of business and would by default force our country into a single-payer system.

A promising alternative to the single-payer approach to achieving universal coverage is now gaining bipartisan support in the House and Senate. This plan, I believe, has a good chance of being enacted in some form relatively soon. I believe the plan would preserve the strengths of our health care system—its strong incentives for innovation and timely access to high-quality care for those who are insured—while at the same time ensuring that every American has comprehensive coverage and that health care cost increases are mitigated. The plan is modeled after the Federal Employees Health Benefits Program (FEHBP), which also provides coverage for Members of Congress and their families, and has a track record in restraining health care cost inflation and providing quality care. Under this program, insurers who are certified by the government as meeting coverage and fiduciary standards compete with one another to attract and retain plan participants by ensuring ready access to quality care, keeping premiums reasonable and offering attractive coverage options. This plan is not perfect, but it is a novel idea and a good starting point for debate.



To further reduce costs and improve quality, I would work to ensure that any plan has a strong component of preventive health and wellness coverage. All insurers participating in the program would be required to ensure that every patient has a medical home with a primary care doctor who would oversee the care the patient receives and who would be paid bonuses for patient care management. All participating insurers would be required to adopt standardized electronic medical records and prescribing systems, which have been proven to reduce medical errors, improve quality and hold down costs. A recent Rand Corporation study estimated that with widespread use of health information technology such as electronic medical records and electronic prescribing, the U.S. health care system could save \$162 billion a year—that would go a long way to providing assistance to the uninsured to buy into a health care plan.

We are clearly at a crossroads, but one thing is for sure: the status quo is unacceptable. We must pursue policies that give working families the peace of mind that their health care is provided for. Michigan's families are already struggling to get by, and working to ensure that they have access to timely, affordable and the most up-to-date health care is a step in the right direction.



**INVITED ARTICLE**

**The Beginning of Public Health in Michigan  
Michigan State Board of Health Reports, 1873-1900**

**Paper 2 – Early Successes Against the Odds**

G. Elaine Beane, PhD

Center for Nursing Workforce & Policy at the Michigan Public Health Institute

Robert E. Mosher, PhD,

Principal, MB Research Associates.

This is the second in a series of short papers drawn from the Michigan State Board of Health (MSBH) Annual Reports, Supplements, and Sanitary Convention Reports from 1873 to 1900<sup>i</sup>.

Our intent is to assemble excerpts from MSBH Reports from 1873 through 1900, focused on specific public health concerns. We will provide some background information and comparisons, but the MSBH authors will speak in their own words.

The first paper looked at the genesis of the MSBH, the founders and the effects of their experiences during the Civil War on their public health interests.

This second paper deals with the early successes and travails of the new MSBH as it got organized and attempted to address problems, while structuring the flow of information and managing its relations with the over 1,000 local Boards of Health.

**MSBH Gets Organized**

The Michigan State Board of Health (MSBH) was authorized and convened in 1873, after three difficult years of organizational and political efforts seeking its formation.

The six members of the first MSBH were appointed by Governor John J. Bagley: Zenas E. Bliss, MD (Grand Rapids); Rev. Charles H. Brigham (Ann Arbor); Rev. John S. Goodman (East Saginaw); Homer O. Hitchcock, MD (Kalamazoo); Robert Clark Kedzie, AM, MD, ScD (Lansing); and Henry F. Lyster, AM, MD (Detroit). This Board elected Dr. Hitchcock as President and Dr. Henry B. Baker as Permanent Secretary of the MSBH and Superintendent of Vital Statistics. In an 1878 retrospective on the first five years of the Board, Dr. Kedzie said that "...the Board found the largest liberty of choice of what to do, because everything was yet to be done.

"The first effort of the Board was to reduce to system the work of the members of the Board, by appointing a number of standing committees on the general topics which would come before them for consideration. In this way each member was assigned to some field of inquiry and investigation most congenial to his habits and tastes; at the same time, the field of state medicine was, to a certain extent, mapped out into distinct departments. The general plan of dividing up the work of the Board among a number of standing committees has been so successful in its



working that every State Board of Health subsequently organized in this country has followed our example in this respect.

“The second step of the Board was to organize the sanitary forces throughout the State by securing well organized and effective Boards of Health, wherever such Boards were not in existence, in all the cities, villages, and townships in our State, with an active health officer in each Board; and then to bring the State Board of Health into communication and active cooperation with all these local Boards of Health. ...Two prominent objects were to be secured by this means: (1) To have an effective channel for imparting information to the people in a form which would most successfully reach the masses...(2) To have organized bodies through which the statistics in regard to public health could be gathered from all parts of the State.

“The third step of the Board was to enlist in the peculiar work of the Board all the physicians of the State and all other persons interested in sanitary matters. A corps of special correspondents was also secured in many prominent points in the State to gather more complete information on any subject relating to the public health.”<sup>iii</sup>

### **MSBH Early Successes**

Following this organizational model, the early successes of the MSBH were rooted in a) investigations by standing committees of conditions thought to cause disease; b) persistent and close attention to a standardized system of data gathering from local Boards of Health and dissemination of health advisories and circulars to local Boards; and c) vigorous efforts to establish a statewide constituency through widespread Sanitary Associations and Sanitary Conventions.

***Investigations by Standing Committees:*** Each MSBH member became the leader of a standing committee on which other experts and interested members of the community served. The MSBH standing committees addressed specific aspects of the environment in which people lived, including air, water, land, buildings, food, and nuisances. The members of the standing committees applied what they knew from existing research in their field and from experience, collected information that they identified as relevant to disease control, and persuaded others to join them in sanitation improvement. There were few effective treatments for disease at this time, and improvement in the living conditions of the people appeared to offer the best opportunity for improvement of the population’s health. The work of the standing committees will be the subject of future papers in this series.

In 1874, the new MSBH sent a circular to the local Boards of Health detailing the sanitarian approach to disease control, calling attention to the law and to the duties of local boards relative to diseases dangerous to the public health.

“All diseases dangerous to the public health are greatly modified in character, and some of them largely preventable, through those agencies which ensure to a people, air free from contamination with either the effluvia from animal or the miasm from vegetable decomposition, and which also secure to them pure water and wholesome food.

“...Among the sources from which are generated active causes of disease and death, are the following: slaughter-houses, soap-boiling factories, bone and fat-rendering establishments,



tanneries, pig-sties, neglected privies and stables, filth-sodden ground, putrescent animal or vegetable material from whatever source, foul cellars, imperfect water-closets, foul or obstructed sewers or house drains, mill ponds, swamps, marshes, cesspools, stagnant water, imperfect ventilation of places of public resort, diseased meat, stale fish, impure milk, unripe fruit, decayed vegetables, adulterated food, and impure water; the latter may be contaminated from too close a proximity to a privy-vault, or an imperfect sewer or house drain, at other times by surface water.

“It is the duty of a local Board of Health to remove, as effectually as possible, all local causes of disease, by a thorough system of inspection, of disinfection, and by the reconstruction, or the condemnation and removal or destruction of the sources from which are generated these causes; and whenever there are reasons for expecting the possible visitation of a contagious or infectious disease, or during the prevalence of an epidemic or endemic disease, the obligation to remove these causes becomes imperative.”<sup>iii</sup>

The identified problems and the proposed solutions were major undertakings; local Boards of Health varied greatly in the abilities and resources that would permit them to take on these tasks. They were aided to the degree possible by bulletins and circulars from the MSBH, and by the interactions required to gather and send information to MSBH on births, deaths, & marriages, diseases, and living conditions.

***Interactions with Local Boards of Health:*** Dr. Baker, Permanent Secretary of the MSBH, maintained a steady stream of communications with the health officer at each of the local boards of health and could both send health information to and request health information from them. Dr. Baker was strongly interested in vital statistics and his job description made the collection of health information a major task. “He (the Secretary) shall prepare blank forms of returns, and such instructions as may be necessary, and forward them to the clerks of the several boards of health throughout the State. He shall collect information concerning vital statistics, knowledge respecting diseases, and all useful information on the subject of hygiene, and through an annual report, and otherwise, as the board may direct, shall disseminate such information among the people.

“...It shall be the duty of the health physician, and also of the clerk of the local board of health in each township, city and village in this State, at least once in each year to report to the State Board of Health their proceedings, and such other facts required on blanks and in accordance with instructions received from said State Board. They shall also make special reports whenever required to do so by the State Board of Health. ...it shall be the duty of all officers of the State, the physicians of all mining or other incorporated companies ...to furnish to the State Board of Health any information bearing upon public health which may be requested by said board.”<sup>iv</sup>

Operating out of the Secretary of State’s office, Dr. Baker set up systems for requesting, receiving, and compiling vital statistics, health statistics, and other information from local health officers and boards. The law setting up the MSBH required that the local health boards, health officers, government agencies, and even businesses comply with requests from the MSBH, but the reality was much more complicated and success required a great deal of energy and persistence.



**Michigan's 1874 Reality:** At the end of 1874, Dr. Hitchcock, President of the MSBH, delivered the Second Annual Address, entitled *Local Boards of Health*. Dr. Hitchcock was the practical philosopher of the MSBH, and noted that he would not “review the struggles...of the infancy of this board, nor felicitate ourselves by magnifying its infantile achievements, but look forward to ...some of the means of which it is to avail itself for higher usefulness, briefly to point out what are *The Necessities for, The Proper Constitution, Status, Functions, and Relations of Local Boards of Health within Our State.*”<sup>v</sup> The first section of this Address [*The Necessities for ...Local Boards of Health*] provides a good review of the environmental problems (derived from the natural, built, and social environments) that were viewed as causing disease.

Establishing the rationale for action to improve sanitation, Dr. Hitchcock set a goal of a Michigan in 1925 that would be “...full of vigorous men and women, looking forward to the normal longevity of the human race, the patriarchal age (100 years), with no other causes of death than accidents or old age...Our death tables would then be completely reversed, and after the first century had passed, deaths would be far more numerous of persons from 95 to 100 years old than of persons in the first five years of life. Then, too, all those vast sums of money, now lost by the expenses and time wasted by preventable sickness and death, would be saved to the State to increase her available wealth. Those millions of treasure, too, that are now worse than squandered in pandering to the depraved appetites and perverted tastes of the people, would then be employed in developing all the natural and material resources of the State.

“...Now there stand in the way of (this goal), numerous facts appertaining to the ancestry of the unborn children of Michigan, to the children themselves, to the families in which their first years will be spent, and to the neighborhood, village, city, and State in the midst of which their later years will be passed. ...Almost every child comes of parents in whose constitutions lurks some taint, that leaves upon their progeny some degeneracy in body, mind, or morals, some tendency to premature decay and death. These tainted strains of blood have various origins, but all flow towards disease of mind or body, perversion of moral character, and premature death. Alas, how many of them take origin in intemperance and lust!

“...The natural conservatory of the individual child is the family. The parents are the natural and proper interpreters, teachers, and enforcers upon the child of the laws of health. But alas! In what unfavorable and too often fatal hygienic conditions are children placed by the ignorance, carelessness, or selfish neglect of those who ought to rear them in the most complete accord with all the laws of hygiene. (As an illustration), I have grouped many well authenticated cases of disease and death as having occurred in a single family, one well to do, occupying a respectable house with “modern improvements” upon a fashionable street of a delightful village.

“...In this home of comfort, ...children are often compelled, in the very first weeks of their existence, to inhale impure air from a small, non-ventilated room and confined exhalations from unclean clothing and from the unwashed bodies of their parents, thus laying foundations for marasmus, scrofula, and consumption. They are soon fed food entirely unsuited to their powers of mastication,...or milk poor in quality on account of the bad food or ill health of the cow, or mixed with ingredients absolutely injurious. ...Nervous diseases, diarrhea, cholera infantum, dysentery, or typhoid fever follow.



“...If perchance any children escape the dangers surrounding their nursery years, in their childhood they run about a (luxurious) house, only to inhale an air made foul by an untrapped or broken drain, or an open cesspool beneath the house, or a “convenient” privy vault; ...or the air of the whole house is laden and poisoned by exhalations from decaying vegetables in the cellar...the bedrooms of these children are covered with bright and showy wallpaper, pleasant to the eye, but which loads the air with fine dust of arsenic<sup>vi</sup>, and slowly poisons the innocent sleepers, and fixes upon them an obscure and lingering ill health, or leads them...to an untimely death.

“...Children in this house, too, drink water drawn or pumped from a well contaminated by means of a near cesspool, privy-vault, or broken drain, or by the gathering debris of decaying wood curbing, or by the decaying bodies of dead animals. Many times does the dark winged messenger come to this home of comfort ...in the form of typhoid fever, dysentery, diphtheria, malignant scarlet fever, or deceptive but inevitable consumption. ...his coming is unwelcome, and is mourned as a providence black with mystery. And yet this harvest of death has grown according to God’s own established and revealed laws, from the seeds sown and fostered by ignorance, selfish carelessness, and neglect in the family. But the family is not alone chargeable with being the source of unfavorable conditions and influences that swell the vast stream of premature and avoidable deaths and preventable sickness. ...The children of an otherwise healthy family sicken and die simply because the neighbors persist in fouling the air by the death-bearing odors of putrescence, or ...the waters of the wells are contaminated by the saturation of the soil and percolation of fluids from decaying animal or vegetable matters in their reeking, festering cesspools and privy vaults.

“The contamination of streams by the offal of slaughter houses, the washings and waste of certain manufactories, the offal and sewage of houses, villages, or cities, ...the undrained swamps and marshes of the country, are all sources of great danger to health that no one person or family is responsible for or can remove or control. Many articles of commerce are in themselves, their adulterations, or their unrestricted sales sources of great danger to life and health. ...How are all these dangers to the people of this State to be avoided? How are so many premature deaths and so much needless sickness to be prevented? How are the sons and daughters of Michigan to be made the stalwart men and women, looking forward to the longevity of the patriarchal age, supposed at the commencement of this address?”<sup>vii</sup>

Dr. Hitchcock first answers this question by urging that the education of all children include physiology and hygiene, which would require that school boards and teachers be educated to teach these subjects. Physicians should be educated in preventive medicine and hygiene and become health educators in their practices and communities. “Then the physician will, as he should, be paid not so much for his remedies and skill to cure, as for his watchful care and his success in keeping his patrons well. Then will he be employed and paid by the year as a hygienist, instead of ...for each call upon the sick.

“...But were all our physicians educated and faithfully practicing hygienists, guiding individuals and families to the practice of the laws of health and awakening and leading public sentiment to enact and enforce suitable and effective laws with regard to public health, there would still be ...a large field for vigilant scrutiny into unfavorable hygienic conditions and unhealthy practices.



...And when we consider that the great majority of physicians at present suppose that the proper relation of a physician to the public is only that he attend upon the sick when called ...for so much per visit, and that (physicians) are scarcely more awake to the idea of the prevention of disease than the common people, ...the absolute necessity becomes very apparent that there should be in every village, town, or city a LOCAL BOARD OF HEALTH.

**Local Boards of Health: Plan vs. Actual:** To be efficient, Dr. Hitchcock stated, a local board of health should have three to five members, more than one of whom should be “well educated, active, honest physicians. The other members ought to be selected for their ...intelligence upon the subject, their earnest and practical activity, and their honest fearlessness in the discharge of known duties. If possible, a lawyer and an engineer should be upon the board. A board made up of persons elected to other offices ...has no guaranty of its efficiency as a board of health. Boards of health cannot thrive, for the interests of society, in the soil of politics. ...The functions of a board of health must be for all the people, and not in anywise for a party. No clique, no church, no class, and no party must constitute or control it.

“...But since by law, the supervisor and justices of the peace of every township ...are made a board of health for their respective townships, and the township clerk is made the clerk of such board; and the major and aldermen of each incorporated city...and incorporated village in the State are required to perform all the duties of a board of health, ...it is very important that such boards of health do organize immediately after the election (and choose) the most thoroughly competent, active, and honest physician in the town as health officer and executive member of the board, fixing for him an adequate salary.

“...there are in Michigan between eleven and twelve hundred local boards of health (and) only about one-fourth have appointed health officers. These boards ...seem to have concerned themselves with their duties in relation to cemeteries and other provisions for burying the dead, ...the only duties that most of them perform (providing) a sepulchral twang of irony. Ought not (the MSBH) make the most strenuous endeavors to induce all the boards of health in this State, ...to endeavor to do something towards the prevention of cemeteries and burying grounds being so rapidly filled up by preventable causes of death?

“...A local board of health should be not only didactic and advisory, but judicial, mandatory, and executive. It should seek to make as general as possible in its community a knowledge of the common laws of health, and the best means of avoiding sickness – sporadic or epidemic; the dangers to life and health that may arise from impure air, or water and unwholesome food. ...The board should be one of ultimate appeal for persons or families whose lives, health, or comfort are endangered by any arrangements or conditions unhygienic occurring outside their own homes, or which are beyond their control.

“...As there will be found many such unhealthy conditions for which no person or persons can be reasonably held responsible, and many others whose responsible authors cannot be persuaded to their complete alteration or removal, the board must have an executive authority and an executive officer whose duty it (is to) carry out all the commands of the board.<sup>viii</sup>

“...Such a board of health should establish and cause to be published ...certain rules and regulations looking to the sanitary welfare of the people, in the way of the prevention and



restriction of diseases. As it would be far better if those rules could be ...quite uniform for all local boards throughout the State, I herewith submit to the State Board a set of sanitary regulations (to be) recommended for adoption by the all the local boards of this State.<sup>ix</sup>

“(Local Boards) should advise and insist on precautions against accidents, by requiring guards and cautions to be placed in all situations of special danger; ...attend carefully to the drainage of low wet lands, as well as to the drainage and sewerage of their respective villages and cities. ...the particular attention of local boards should be given to the water supply of towns, villages, and cities. The location and regulation of gasworks, as well as of many other mechanical works, should be in their hands. Their attention should also be given to the location, construction, arrangement, and condition of school buildings, hospitals, asylums, almshouses, jails, and lock-ups.

“The statistics of mortality in their respective towns, villages, and cities, should be carefully collected and ...tabulated. A general survey and record of the geological, geographical, and meteorological influences upon health and disease in their respective localities should be kept, and a copy forwarded to the (MSBH). ...It is of very great consequence that the clerks of local boards should be efficient and faithful in ...the careful and truthful records of all the ascertainable facts in respect to unusual instances of death or disease from any unfavorable hygienic conditions; and in regard to ...the undoubted modification of sickness or the progress of epidemics by the institution of special hygienic measures or the more rigid enforcement of the laws of health. All of these facts ...may be of vast utility to the State Board of Health in the discharge of its broader and more general duties and its important generalizations.

“...Local boards should very largely serve as the means of communication of the people with the State Board and of the State Board with the people. ...The more perfectly is the mutual and intimate relation and dependence of the State and local boards understood and acted upon, the more efficient and complete will be the work of all. ...local boards of health ...if conscientious and faithful, must expect to perform a large amount of gratuitous labor, and in its accomplishment they must expect to find their chief reward, recognizing the force and beauty of the motto of Haroun-al-Rashid, that ‘He only worships God acceptably who makes himself useful to his creatures.’”<sup>x</sup>

As a practical philosopher, Dr. Hitchcock produced ideals and advice that remain appropriate today; he also had a gift for pungent phrases and aphorisms, particularly in the description of conditions he abhorred.

Summing up the early successes of the MSBH from the vantage point of 1878, Dr. Kedzie felt that the MSBH had worked well with the local boards of health in terms of communication of information. “...These efforts both to impart information and to gather statistics bearing on the public health have met with gratifying success. Not only sanitarians but the people at large are grasping that very important and revolutionary idea, the possibility of the prevention of sickness and death, that many diseases may be prevented altogether ...or they may be walled in like an inundation. A people that fully grasps the idea that half of their sickness and half of their deaths may be prevented ...has taken a long stride in state medicine.



“...But the people need to ...clearly comprehend one additional fact, that each person is in the broadest and fullest sense healthy and safe only as every person about him is also healthy and safe. ...The lesson that society is an organic whole and that ‘if one member suffers all the members suffer with it’ the people are slow to learn.”<sup>xi</sup> We are still working on our comprehension of that principle.

<sup>i</sup> The published reports, now 108-135 years old, have been scanned using Optical Character Recognition (OCR) software, followed by proof-reading and correction. The selections reproduced here are as accurate as we can make them. The compilation of MSBH publications that are used as the basis for this series of papers has been made available to the Michigan Public Health Association.

<sup>ii</sup> Kedzie, R C, “The Work of the State Board of Health [The Annual Address for 1878]”, published in the *Michigan State Board of Health – Report of the Secretary 1878*, pp 1-14.

<sup>iii</sup> *State Board of Health – Report of the Secretary. 2<sup>nd</sup> Annual Report – 1874*: pp xi-xii.

<sup>iv</sup> Compiled Laws of the State of Michigan, Act No. 81, Laws of 1873, Sections 5, 8, and 9.

<sup>v</sup> *State Board of Health – Report of the Secretary. 3<sup>rd</sup> Annual Report – 1876*: pp 2-10.

<sup>vi</sup> R. C. Kedzie, MD, “Report of the Committee on Poisons”, published in *State Board of Health – Report of the Secretary, 1<sup>st</sup> Annual Report – 1874*: pp 55-62. The MSBH also sent out 100 copies of a book of wallpapers -- *Shadows from the Walls of Death* -- printed with ink containing cupric-acetoarsenite (Emerald Green or Paris Green) to show the types of wallpaper that people should not put in their houses. Several deaths and many unexplained illnesses were attributed to arsenic-containing dust from these wallpapers. “Paris Green is a common name for cupric-acetoarsenite, an extremely toxic blue-green chemical with four main uses: pigment, animal poison, insecticide, and blue colorant for fireworks....It was once used to kill rats in Parisian sewers, hence the common name, Paris Green. Scheele’s green is a chemically simpler...arsenic pigment used before Emerald Green. ...It was popular as a wallpaper pigment, and would degrade, with moisture and molds, to arsine gas. Emerald Green was Cezanne’s favorite pigment. ...Cezanne developed severe diabetes, which is a symptom of chronic arsenic poisoning.” (See <http://encyclopedia.thefreedictionary.com/Paris+green>.)

<sup>vii</sup> *State Board of Health – Report of the Secretary. 3<sup>rd</sup> Annual Report – 1876*: pp 2-10.

<sup>viii</sup> At this point, one understands Dr. Hitchcock’s earlier requirement that all members of Local Boards of Health must demonstrate “honest fearlessness in the discharge of known duties.”

<sup>ix</sup> See “Rules and Regulations recommended by the State Board of Health for adoption by Local Boards of Health” published in *State Board of Health – Report of the Secretary. 3<sup>rd</sup> Annual Report – 1876*. These Rules and Regulations focused on: a) privies, cesspools, sewers, drainage, and the disposal of excreta, dead animals, and garbage; the keeping of hogs, sick animals, or slaughterhouses within city or town limits except under specific conditions; and controls on contagious diseases (vaccination for smallpox; destruction of infected materials in cases of cholera, yellow fever, scarlet fever, diphtheria, or smallpox; isolation of sick persons and households; and reporting of disease). The Rules are accompanied by extensive comments from Dr. Baker.

<sup>x</sup> *State Board of Health – Report of the Secretary. 3<sup>rd</sup> Annual Report – 1876*: pp 2-10.

<sup>xi</sup> *State Board of Health – Report of the Secretary. 1878*: pp 1-14.



**RESEARCH AND PRACTICE ARTICLE**

**Changes in Immunization Practices, Knowledge and Beliefs of Michigan Obstetrician-Gynecologists Since 2000**

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**INTRODUCTION:**

Obstetrician-gynecologists are health care providers for women over the life cycle and are often the only source of medical contact for non-pregnant women (Leader & Perales 1995). Primary care has increasingly, though not universally, become part of the standard practices provided by obstetrician-gynecologists; a recent study (Schrag, et al., 2003) found that over half of obstetrician-gynecologists view themselves as fulfilling a primary care role.

An important component of primary care is the administration of vaccines against diseases that have an impact on general health and well-being (e.g. influenza). Additionally, infections remain a leading cause of preventable morbidity in pregnant women and newborns (Anderson, 2001). A 2000 survey of obstetricians and gynecologists in Michigan found that a majority of providers considered screening for vaccine-preventable diseases an important responsibility. However, only 10% routinely assessed whether patients had indications for all of the vaccines recommended for use in pregnant or recently delivered women. Moreover, one quarter of providers in this survey did not administer any vaccines to obstetric patients (Gonik et al., 2000). A national study (Schrag et al., 2003) found that only about two thirds worked in practices that offered at least one vaccine type and only 10% worked in practices that offered all six of the primary vaccines recommended for adults and/or pregnant women.

Both of the aforementioned studies (Gonik et al., 2000; Schrag et al., 2003) found that obstetrician-gynecologists identified costs of vaccination and a belief that vaccine administration was not the responsibility of obstetrician-gynecologists as the primary reasons for not offering vaccines. Given that these two studies are several years old, it is important to assess if there has been any change in obstetrician-gynecologists' practices and attitudes regarding immunizations.



This study surveyed all ACOG fellows in the state of Michigan in order to compare the current status of immunization in obstetrician-gynecologist practice with that determined by Gonik and colleagues nearly a decade ago.

## **MATERIALS AND METHODS:**

**Sample:** Questionnaire surveys were sent to 912 Fellow and Junior Fellows of the American College of Obstetricians and Gynecologists (ACOG) in Michigan. A Fellow is a member who has a current medical license, is in medical practice focused on women's health, and is board certified in obstetrics and gynecology. A Junior Fellow is a member who meets all the requirements to be a Fellow of the College except that they are not board certified. ACOG Fellows and Junior Fellows comprise at least 90% of the practicing obstetricians and gynecologists in the United States.

This study was part of a larger study on immunization involving all regions in ACOG's District V: Ohio, Kentucky, Indiana, Michigan and Ontario, Canada. Initial mailings were sent in June 2007. Those who did not respond were sent four reminder mailings. Questionnaires returned by December 19, 2007 were included in data analyses.

**Survey:** The questionnaire was approved by the Institutional Review Board at the University of Louisville, and submission of a completed questionnaire indicated consent. The questionnaire consisted of five sections: 1) a series of items regarding the respondents' demographic characteristics and those of their patient populations, 2) practices regarding vaccination, 3) practice, knowledge and beliefs specifically regarding the HPV vaccine (this data is reported elsewhere), 4) beliefs and knowledge regarding other vaccines, such as the influenza vaccine, etc., and 5) background information regarding their view of immunization education in medical school and residency, as well as their views on what would help improve their ability to administer vaccines and disseminate knowledge of immunization to patients and clinicians.

Several knowledge questions were asked, for which the CDC and ACOG's recommendations were used to determine the correct answers (ACOG, 2004). Three vaccines are considered safe during pregnancy: TDAP, Influenza, and Hepatitis B (HBV) and two are not indicated: MMR and Varicella.

The study protocol was reviewed and approved by the Institutional Review Board at the University of Louisville.

## **DATA ANALYSIS:**

Data were analyzed using a personal computer-based version of SPSS 15.0 (SPSS Inc. Chicago, IL). For chi-squared tests with medical school graduation year as a factor, we created three approximately equally-sized groups: before 1983, between 1983 and 1992, and after 1992. Because the proportion of women obstetrician-gynecologists has steadily increased over time, for instances where graduation year was used as a factor in the analysis we statistically controlled for gender, and vice versa. Analyses were done using ANOVA and chi-squared tests. Significance was evaluated at  $p < .05$ , and confidence intervals of 95%.



**RESULTS:**

A total of 287 surveys were returned from physicians currently in practice, for a response rate of 32%. Selected demographic data pertaining to this latter group are shown in Table 1. Over half (52.3%) of the respondents were female. Physicians with more years in practice were more likely to be male ( $\chi^2 (2) = 53.292, P < .001$ ) and to specialize in only gynecology ( $\chi^2 (14) = 32.44, p = .003$ ).

Most physicians (67%) graduated from medical school between 10 and 30 years ago, with a median of 22 years ago. Fifty-six percent of the physicians said they provided obstetric, gynecologic and primary care services; 25.4% provided obstetric and gynecologic care only; the remainder provided gynecologic care with and without primary care, or only obstetric services. In total, 61.4% of responding physicians acknowledged they provided primary care to some of their patients, which is greater than the 47% reported by Gonik and colleagues (2000). With regard to which age groups they served, 97.1% served adolescents and women of childbearing age, 2.4% did not serve postmenopausal women. In the 2000 study (Gonik et al., 2000) 12% did not care for adolescents; this was down to 6.2% in this study. Nearly all provide gynecologic care to adolescents (94%), women of childbearing age (97.1%) and postmenopausal women (97.4%). A majority provide obstetric care for the same groups (82.2% in adolescents and 88.6% in women of childbearing age). Fewer physicians provide primary care for their patients. Less than half provide primary care for adolescents (40.6%) and postmenopausal women (47.8%) and 60.9% provide primary care for women of childbearing age.

Physicians were asked whether they currently assessed their patients for nine vaccine-preventable diseases and five associated vaccines (tetanus/diphtheria/acellular pertussis, measles/mumps/rubella, influenza, varicella, and pneumococcus). If an affirmative response was given, they were asked whether they actually administered the indicated vaccine (allowing for the possibility of delaying administration until the postpartum period) or referred the patient to another health care provider. Only 3% of respondents did not assess their obstetric patients for these nine diseases, down from 19% in 2000. The highest proportion of those who provide obstetric care assessed the need for two (20%) or three (22%) or four (20%) of these vaccines. In order of frequency, influenza (86%), measles/mumps/rubella (72%), and varicella (51%) each were assessed by over half of responding obstetricians. About one quarter (25.8%), down from 40% in 2000, of physicians did not assess for any vaccine-preventable disease for their gynecologic patients. Fourteen percent assessed for all nine diseases. The most frequently assessed were influenza (66.6%), measles/mumps/rubella (41.8%) and tetanus/diphtheria/acellular pertussis (36.9%).

When asked to rank reasons for not administering an indicated vaccine in the office, 42.1% agreed or strongly agreed that immunization is not part of their routine patient care. This reason was also the most commonly cited deterrent in the 2000 study (Gonik et al., 2000). The next most common answers in this study were related to financial concerns: high cost to order (62.7%), high cost to store (65.5%) and inadequate reimbursement (60.7%). Over one-quarter (26.3%) cited a lack of available vaccines. Our results show that 18.1% agreed or strongly agreed they were uncertain of recommendations, and 9.2% were uncomfortable with vaccine



administration. Over half (57.5%) of respondents agreed or strongly agreed that demand for immunizations in their practices is low.

The survey contained three sets of knowledge questions regarding the CDC's vaccination recommendations (see Tables 2 and 3). The first concerned current recommendations regarding hepatitis B (HBV) vaccination. Ninety-six percent of respondents recognized CDC recommendations to give this vaccine to patients in high-risk occupations, and 70.7% identified the need for HBV vaccination in adolescents. This latter statistic is in sharp contrast with the 69% who were *unfamiliar* with the adolescent HBV recommendation in 2000 (Gonik et al., 2000). A small amount (15%) of physicians indicated that all women over age 65 years required vaccination against hepatitis B, although the current CDC recommendation indicates this should be given only if other risk factors are present. For influenza, 87.1% agreed with the CDC that maternal morbidity and mortality increased in the second and third trimesters. When physicians were asked about vaccine safety in pregnancy 50.9% and 62.4%, agreed with the CDC that tetanus/diphtheria and hepatitis B vaccines were safe to administer. Most (89.2%) believed the influenza vaccine is safe during pregnancy, and 31.4% thought the pneumococcal vaccine was safe to administer in pregnancy. A small minority of physicians indicated that it was acceptable to give measles/mumps/rubella (2.1%) and varicella (8.4%) vaccines during pregnancy, contrary to current recommendations. Overall, only 4% of physicians answered all components of the knowledge-based questions correctly. No respondent answered all incorrectly and only 1.7% answered fewer than seven questions correctly.

Two opinion questions that required a scaled response were asked in the survey. The first queried whether routine screening for vaccine-preventable diseases is outside the scope of practice for an obstetrician-gynecologist. Fourteen percent agreed or strongly agreed with this statement, compared with 15% who were neutral, and 70.7% who disagreed or strongly disagreed (see Figure 1).

A series of correlations were run examining physician characteristics, practice patterns, opinions, and knowledge. Female physicians were more likely to have fewer years in practice compared with male physicians ( $\chi^2(2) = 53.3, P < .001$ ).

Physicians who acknowledged that they performed primary care were more likely to assess their gynecologic patients for vaccine-preventable diseases (seven of 8  $\chi^2$ s significant at  $P < .05$ ) and more likely to assess their obstetric patients for MMR ( $\chi^2(1) = 6.043, P < .05$ ). There were no significant differences between physicians who practiced primary care and those who did not in their responses to the knowledge-based questions.

## **DISCUSSION:**

Immunization is an important primary care preventive practice and, as primary care providers, obstetrician-gynecologists have unique opportunities to immunize women across the life cycle (Schrag, 2003). Immunization will also minimize the impact of diseases on the fetus, and will reduce transmission to others. This study aimed to determine if there have been changes in Michigan obstetrician-gynecologists' knowledge, attitudes and practices regarding immunization over the past several years.



We can see that in just less than one decade, there has been an increase in the proportion of Michigan obstetrician-gynecologists who report that they provide primary care to their patients (61.4% in the current study vs. 47% in 2000), and are caring for adolescents (in 2000, 12% did not care for this age group vs. 6.2% in the current study). More physicians view the administration of vaccines as within their professional role (see Figure 1) and part of their usual patient care activities, a phenomenon which is occurring across physician age groups. For example, in 2000, 60% responded that vaccination was not part of their usual patient care activities. In the current study, 42.1% agreed or strongly agreed that immunization is not part of their routine patient care. Additionally, in 2000, 60% responded "it is not part of my usual patient care activities" as the most frequent response, compared with 42.1% agreeing or strongly agreeing with this statement in the current study.

Unlike in 2000, there was no difference between genders in their support of the view that screening for vaccine-preventable disease is a part of routine obstetric and gynecologic care. However, it is of note that while in 2000 those with more years in practice were less likely to consider vaccine screening as a part of routine care and also score lower on knowledge related questions, there were no such differences found in the current study.

More Michigan obstetrician-gynecologists are assessing patients' needs for more vaccines. For example, in 2000, 40% did not assess for *any* vaccine-preventable disease in gynecologic patients, compared to 25.8% in the current study. Despite these improvements, further gains are necessary; less than one in five respondents are assessing for all five vaccines in their gynecologic patients. Additionally, while gynecologic patients' needs for the influenza vaccine were the most commonly assessed, and are improved from 2000, only two-thirds are currently assessing this need.

Another important finding is that physicians are generally knowledgeable regarding vaccine recommendations. More physicians (89.2%) believe the influenza vaccine is safe for obstetric patients, and fewer believed that the tetanus/diphtheria/acellular pertussis (50.9%) and HBV (62.4%) when compared with the range provided by Gonik and colleagues in 2000 (73-83%). A smaller proportion also believed that the pneumococcal vaccine is safe for obstetric patients (31.4% vs. 48% in 2000). While a small minority of physicians indicated that it was acceptable to give measles/mumps/rubella (2.1%) and varicella (8.4%) vaccines during pregnancy, contrary to current recommendations, these rates have decreased since 2000 when 6% and 14% of respondents indicated these two vaccines were safe in obstetric patients, respectively. There has been some improvement in immunization-related knowledge over the past eight years; only 1.7% answered fewer than seven knowledge-based questions correctly, down from 5.5% in 2000.

While there have been improvements in the assessment and administration of vaccinations it is important that more gains be made in viewing immunization as within their role, and part of their routine responsibilities. In addition to a view that immunization is not within the professional role of the obstetrician-gynecologist, there are barriers that prevent immunization by this medical specialty. This study showed that a lack of available vaccines has become less of a problem, with only 26.3% currently citing this as a concern, compared with 43% in 2000. Uncertainty regarding current vaccine recommendations and lack of comfort with administration have also



become less common deterrents; in 2000, each of the aforementioned concerns were ranked at 30%, compared with 18.1% agreeing or strongly agreeing they are currently uncertain of recommendations, and 9.2% being uncomfortable with administration.

While vaccines may be more accessible to obstetrician-gynecologists, this study showed that financial concerns act as a deterrent from adopting immunization into routine practice. Over 60% agreed or strongly agreed that inadequate reimbursement, and high costs to order and store vaccines deter them from offering immunizations in their practice. This was higher than the 50% who were concerned about reimbursement in 2000. This may be due to increasing costs of offering immunizations, or an increase in the amount of obstetrician-gynecologists who are considering implementing immunization programs in their practices.

Given that both this study and that of Gonik and colleagues in 2000 found that those who acknowledged they provide primary care are more likely to assess patients for vaccine-preventable diseases, a first step to improve vaccination rates among obstetrician-gynecologists may be to modify the professional role that obstetrician-gynecologists view for themselves. If more obstetrician-gynecologists view themselves as primary care providers, the missed opportunities for the assessment and provision of vaccines may be reduced, improving women's health. Improving obstetrician-gynecologists' willingness to provide assessment and administration of immunizations can have an improvement on patient health, as vaccine-preventable infections have continually been a leading cause of preventable morbidity in pregnant women and neonates (Anderson, 2001). For example, only 13% of pregnant women received the influenza vaccine in 2003 (CDC, 2003), despite the fact that women infected with influenza during pregnancy are at increased risk for serious complications and hospitalizations (Neuzil, et al., 1998). This change can have a particular benefit to a woman's health overall, especially when considering that obstetrician-gynecologists are often the sole medical contact for nonpregnant women (Leader & Perales, 1995).

There are several limitations to this research. Firstly, we relied on retrospective reports, which are subject to errors of recall and subjectivity. Second, it has been demonstrated in the past that there is a discrepancy between physician-perceived responsibility for vaccination administration and actual practices (Gonik et al, 2000); therefore, a prospective and objective study of actual immunization practices is warranted. A third limitation of this study is that not all questions were identical to those of Gonik and colleagues (2000). For example, we did not ask about the hepatitis B vaccine practices as that study did, and we also did not ask respondents to rank reasons for not administering vaccines; this question asked them to indicate on a Likert scale how strongly they felt about each provided reason. This study also had a somewhat low response rate; however, the 32% response rate is no different from the rates obtained in other states in the larger study of all District V. Additionally, this study is not meant to apply to obstetrician-gynecologists nationwide. Given that this research only examined respondents practicing in Michigan, it is possible that the findings are not true for all obstetrician-gynecologists. However, this study corroborates many of the findings in our recent study involving a national sample (*in preparation*), thus mitigating this concern.

Obstetrician-gynecologists have the opportunity to identify women who would most benefit from immunizations by attending to life-style and co-morbid health issues (Leaphart et al., 2003). An



adoption of a primary care role on the part of many obstetrician-gynecologists has likely led to the improvement in the assessment and administration of vaccinations. While more respondents are incorporating vaccination into routine practice, there are still improvements that can be made; there are still obstetrician-gynecologists who are not assessing all vaccines, and fewer are assessing the needs of gynecologic, as opposed to obstetric, patients. An increased focus on the provision of primary care and the reduction of financial barriers may increase the willingness of obstetrician-gynecologists to provide assessment and administration of immunizations, benefiting the general health of women.



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**Table 1:**  
*Demographic Information for All Respondents*

	<u>% of Respondents</u>
<u>GENDER</u>	n = 287
MALE	47.7%
FEMALE	52.3%
<u>PRIMARY PRACTICE</u>	
GENERAL OB-GYN	74.5%
GYNECOLOGY ONLY	12.9%
OTHER	6.4%
MATERNAL/FETAL MEDICINE	5.9%
OBSTETRICS ONLY	0.3%
<u>CURRENT PRACTICE</u>	
LARGE GROUP (FOUR+ PARTNERS)	30.5%
SOLO PRIVATE PRACTICE	19.0%
SMALL GROUP (2-3 PARTNERS)	17.2%
COMMUNITY HOSPITAL FACULTY (FULL TIME)	8.2%
UNIVERSITY FACULTY AND PRACTICE (FULL TIME)	6.8%
UNIVERSITY FULLTIME FACULTY & PRACTICE	6.8%
ONE PARTNER	6.1%
OTHER	5.4%
<u>LOCATION</u>	
SUBURBAN	47.0%
URBAN- NON-INNER CITY	30.7%
RURAL	12.7%
URBAN- INNER CITY	9.5%
<u>ADMINISTER VACCINES</u>	
YES	80.6%
NO	19.4%



**Table 2:**

*Immunization Recommendations for Pregnant Women. (Adapted from: Centers for Disease Control and Prevention. Recommended adult immunization schedule—United States, 2009. MMWR 2008;57(53)).*

<b>Pregnant Women</b>				
	<b>Vaccine</b>	<b>Should be considered if otherwise indicated</b>	<b>Contraindicated during pregnancy</b>	<b>Recommended if other risk factors exist (e.g. lifestyle)</b>
<b>Routine</b>	Hepatitis A (HAV)			<b>X</b>
	Hepatitis B (HBV)			<b>X</b>
	Human Papillomavirus (HPV)			
	Influenza (Inact.)	<b>X</b>		
	Influenza (LAIV) *		<b>X</b>	
	Meningococcal (MCV4)			<b>X</b>
	Pneumococcal			<b>X</b>
	Measles, Mumps, Rubella (MMR)		<b>X</b>	
	Tetanus - Diphtheria	<b>X</b>		
	Tetanus - Diphtheria - Pertussis (Tdap)			<b>X</b>
	Varicella			<b>X</b>



**Table 3:**

*Immunization Recommendations for Non-Pregnant Women. (Adapted from: Centers for Disease Control and Prevention. Recommended adult immunization schedule—United States, 2009. MMWR 2008;57(53)).*

<b>Non-Pregnant Women**</b>					
<b>Vaccine</b>	<b>AGE RANGE</b>				
	<b>19-26</b>	<b>27-49</b>	<b>50-59</b>	<b>60-64</b>	<b>65+</b>
Tetanus, diphtheria, pertussis (Td/Tdap)	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Human Papillomavirus (HPV)	<b>X</b>				
Varicella	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Zoster				<b>X</b>	<b>X</b>
Measles, Mumps, Rubella (MMR)	<b>X</b>	<b>X</b>	*	*	*
Influenza	*	*	<b>X</b>	<b>X</b>	<b>X</b>
Pneumococcal	*	*	*	*	<b>X</b>
Hepatitis A (HAV)	*	*	*	*	*
Hepatitis B (HBV)	*	*	*	*	*
Meningococcal	*	*	*	*	*

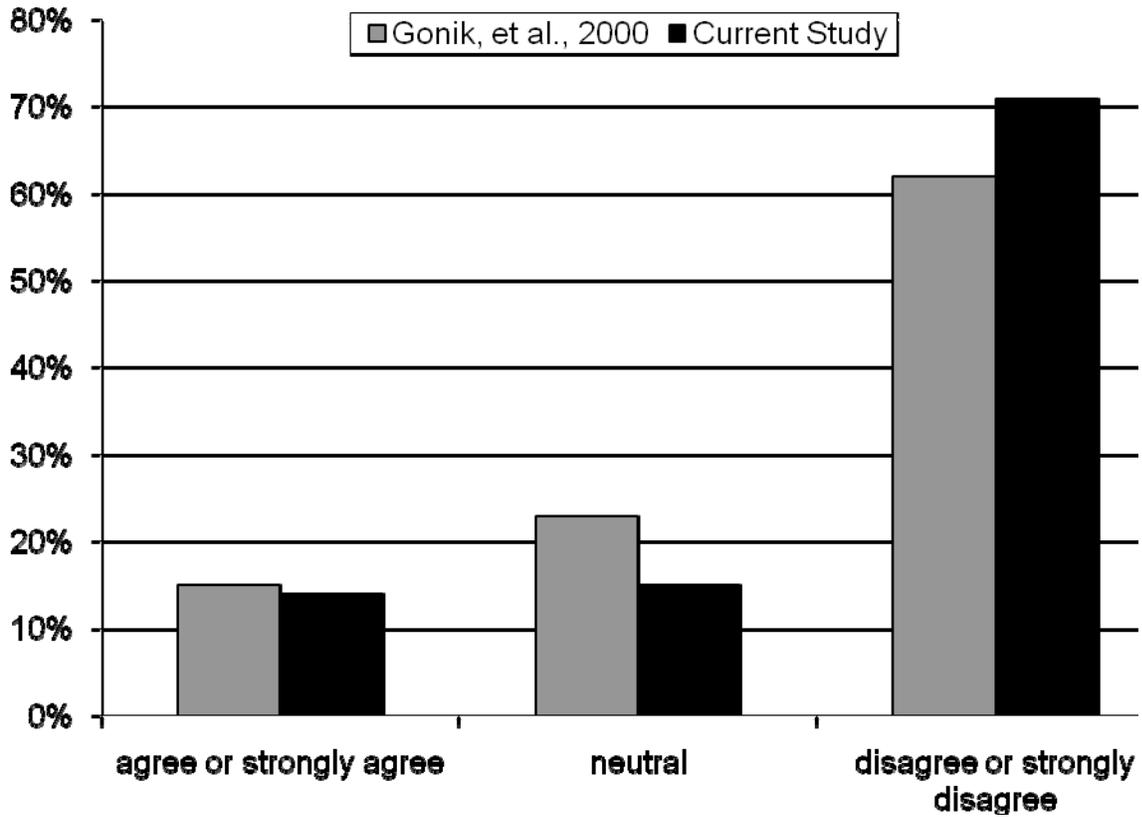
\*Recommended if other risk factors are present (e.g. lifestyle or occupation).

\*\* “Neither inactivated nor live vaccines administered to a lactating woman affect the safety of breast-feeding for mothers or infants. Breast-feeding does not adversely affect immunization and is not a contraindication for any vaccine, with the exception of smallpox vaccine.” (CDC, 2006)

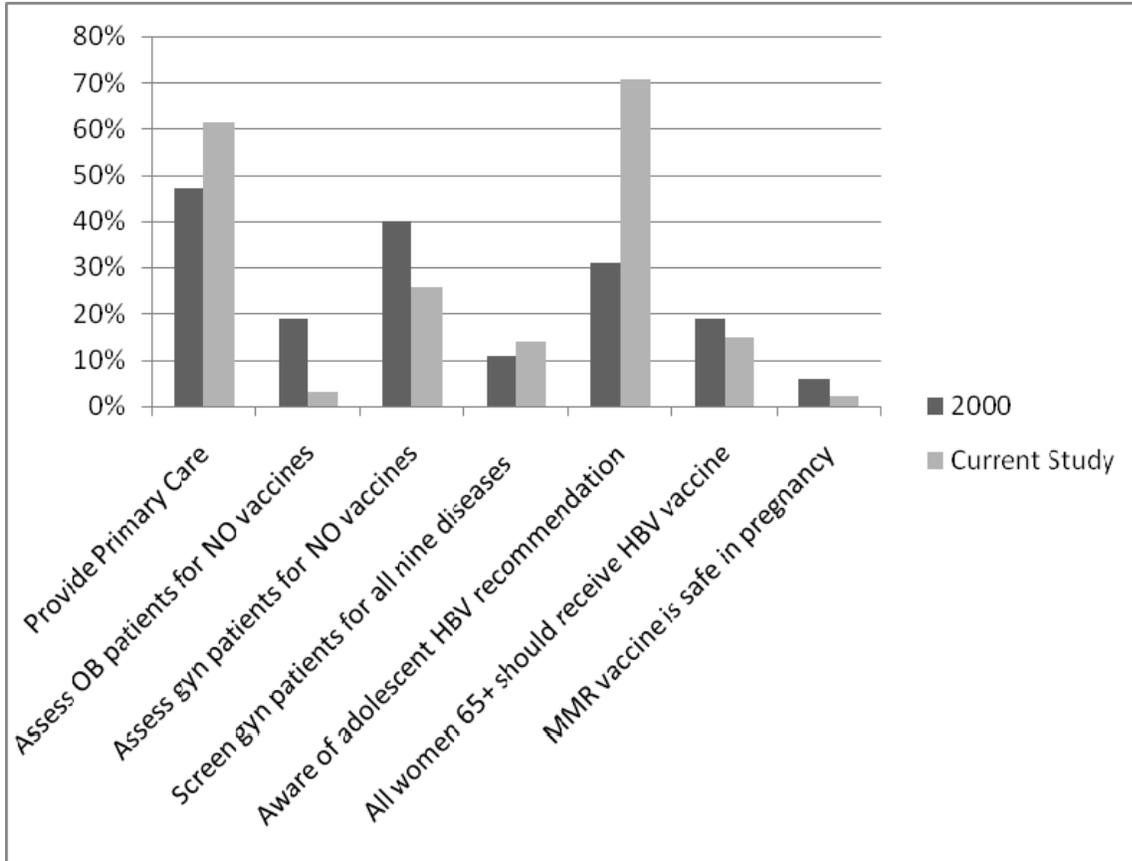


**Figure 1:**

*Level of agreement with the statement “routine screening for any vaccine preventable diseases falls outside of the routine practice of an ob/gyn physician” for Gonik, et al., 2000 and the current study.*



**Figure 2:**  
*Comparisons between the current study and Gonik, et al., 2000.*



**RESEARCH AND PRACTICE ARTICLE**

**Evidence-Based Nursing Practice in Local Public Health**

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**ABSTRACT:**

**Purpose:** The purpose of this study was to identify the extent to which public health nursing in Michigan local health departments (LHDs) has based services and programs on research and other evidence.

**Method:** The study was conducted using a descriptive survey design. The sample was composed of the 45 chief administrators of public health nursing services in each of the 45 Michigan LHDs. Data were analyzed using descriptive statistics. Narrative answers to open-ended items were examined to determine patterns.

**Findings:** Thirty-six (80%) of the chief nursing administrators of the LHDs responded to the survey. Of these nursing administrators, 28 (77.8%) reported using evidence. Two administrators provided a specific process for incorporating evidence into practice, and six administrators reported that a person(s) was responsible for ensuring evidence-based practice (EBP).

**Conclusions:** While a majority of chief nursing administrators in Michigan LHDs indicated that the agency used evidence to support at least some of the nursing services, and programs provided by the agency, the extent of EBP varied across health departments. Most LHDs appeared to be in Roger's (1995) first stage of implementing EBP, indicating that there is a need in Michigan LHDs to advance from abstract acknowledgment (knowledge) of innovation to incorporation of the innovation into action plans that guide practice. Suggestions for translating evidence into public health nursing practice are provided.

**Key words:** public health nursing, evidence-based practice, research utilization, diffusion of innovation, supervision



Evidence-based practice is defined as “practice in which nurses make clinical decisions using the best available research and evidence that is reflected in approved policies, procedures, and clinical guidelines in a particular health care agency” (Ervin, 2002, p. 12). The Institute of Medicine (2003) underscored the need for all health professionals to be educated in delivery of patient-centered care as members of interdisciplinary teams that emphasize evidence-based practice (EBP). Several nurse researchers have pointed out that practice based on evidence, especially research findings, was more likely to be effective, produce desired patient outcomes, and be cost-effective (Brown, 2008; Cullum, Ciliska, Haynes, & Marks, 2007; Goepfinger, Macnee, Anderson, Boutaugh, & Stewart, 1995; Hall, Karstens, Rakel, Swanson, & Davidson, 1995; Melnyk & Fineout-Overholt, 2004; Youngblut & Brooten, 2001).

Much of the research that has demonstrated the use of evidence in nursing practice has occurred in acute care inpatient settings (Heater, Becker, & Olson, 1988; Horsley, Crane, Crabtree, & Wood, 1983). The use of evidence to support initiatives in public health nursing, while relatively newer, is one of the Quad Council of Public Health Nursing Organizations’ public health nursing competency domains, i.e., researching innovative solutions (Quad Council of Public Health Nursing Organizations (Quad Council), 2003). The purpose of the Quad Council, composed of the American Nurses Association, the Association of Community Health Nursing Educators, the Association of State and Territorial Directors, and the Public Health Nursing Section of the American Public Health Association, is to promote collaboration among the member organizations about issues and activities of importance to public health nursing and the health of the public (American Public Health Association, n.d.). The Quad Council supports the use of evidence as the basis for nursing interventions.

Competencies covered in the domain of researching innovative solutions include identifying researchable questions and problems; identifying evidence-based public health interventions; conducting computer searches of the professional literature; conducting computer searches of government websites for innovative evidence-based programs; identifying government, private foundation, and other sources of research funding; and writing grant proposals to support public health programs (Issel, Baldwin, Lyons, & Madamala, 2006).

Several researchers have written that the ability to identify and to use current relevant scientific health information are important competencies, particularly of clinical nurse specialists, nursing administrators, program managers, and directors (Dobbins, Cockerill, & Barnsely, 2001; Ervin, 2007; Kalb et al., 2006). Newhouse (2007) also identified evidence-based decision-making, locating measurement tools for quality improvement, and developing projects that demonstrate innovative approaches to problems as residing within the purview of the nurse administrator. In addition to managerial support, another recent study found that policy revisions, auditing, role modeling, and valuing research are activities that influenced and facilitated nurses’ use of research (Gifford, Davies, Edwards, Griffin, & Lybanon, 2007; Shirey, 2006). Markham and Carney (2008) added to this list the importance of communication between public health nurses and their managers regarding delivery of evidence-based service.

For community and public health nursing, research over the past two decades has begun to contribute to the growing body of knowledge for evidence-based practice, focusing primarily on prevention of disease and injury and health promotion (Armstrong, Fraser, Dadds, & Morris,



1999; Brooten et al., 1995; Olds et al., 1997; Olds, Henderson, Chamberlin, & Tatelbaum, 1986; Olds, Henderson, Tatelbaum, & Chamberlin, 1986; Olds et al., 1998; Rice & Stead, 2008). To what extent the evidence from these research studies and others is systematically incorporated into public health nursing services, programs, and practices is not well documented. The purpose of this study was to identify the extent to which evidence was used in public health nursing services and programs as reported by chief nursing administrators in Michigan LHDs.

### **CONCEPTUAL FRAMEWORK:**

Rogers' (1995) theory of diffusion of innovations guided this study. His five-stage model of the innovation-decision process describes the progression through which an individual or a unit passes from Stage 1) first knowledge of an innovation, Stage 2) to developing an attitude about the innovation, Stage 3) to deciding to adopt or reject the innovation, Stage 4) to implementing the new idea, and Stage 5) to confirming the decision. The first stage in the process, the knowledge stage, begins when a decision-making unit or person becomes aware of an innovation's existence and how it functions. This is the stage to which the study was directed. In order to examine evidence-based practice of public health nurses in Michigan, it was necessary to know the extent that administrators were aware of EBP and used it to support and establish practices and services in LHDs.

### **METHOD:**

The design of the study was descriptive. A cross-sectional survey was used to obtain data about the use of evidence (research and other evidence) in practice, the models used to incorporate evidence into public health nursing practice, and nursing administrators' interest in using more evidence to direct public health nursing practice and services. Data were collected primarily through a self-administered survey. However, when the survey was not returned, the chief nursing administrator was contacted by telephone and interviewed after oral consent was obtained.

### **SAMPLE:**

The sample for the study was the 45 public health nursing services chief administrators at Michigan's 45 LHDs. The 36 (80%) participants were from LHDs that employed between three and 175 public health nurses, with a mean of 21.5 nursing positions. The agencies represented by the participating chief nursing administrators served populations from 36,000 to almost 1.2 million people.

### **INSTRUMENT:**

The investigators developed the survey instrument for the study using the knowledge stage of Rogers' (1995) innovation-decision process as the guiding framework. The instrument was tested by administering it to former public health nurse managers and administrators. Minor changes were made in the questions to increase readability and clarity.



The survey contained 17 questions, two of which had from two to five sub-sections. Completion of the survey required about 20 minutes. The first question was: "Does the agency currently use research or other evidence in public health nursing practice?" If the answer was "yes," the participant was asked to describe the process by which evidence was incorporated into practice, what changes (if any) were made in the organizational structure in order to incorporate evidence into practice, whether there was a person responsible for that function in the LHD, and how much of that person's time was devoted to the functions of EBP, e.g., 10-20%, 30-40%.

Survey question number three was: "How is research currently incorporated into public health nursing practice in this agency?" A list of options was provided, for example, policies based on research or other evidence and protocols based on research or other evidence. The next question asked the participant to indicate about what percent of practice was evidence-based. Questions about services and programs provided, resources supporting evidence-based practice, models used to implement evidence-based practice, and processes for dissemination of information and updating documents comprised the next part of the survey. Additional questions were focused on interest in learning more about evidence-based public health nursing practice, leading public health problems, and demographic information about the LHDs.

#### **PROCEDURE:**

The study was approved by the Wayne State University Human Investigation Committee before data collection began. One survey was mailed to each LHD to either the chief public health nursing administrator or health department director (if there was no identified chief public health nursing administrator). Information about LHDs and names of the contact person were obtained from the Michigan Association of Local Public Health website or by a telephone call to the LHD. A written consent form was included with the survey instrument.

If the survey was not returned within a month of the requested completion date, a reminder postcard was sent to the chief public health nursing administrator with an offer to send another survey if needed. A second reminder postcard was sent to each public health nursing administrator one month after the first reminder postcard if the survey was not returned. If a survey had not been returned within eight weeks of the second reminder, a telephone call was made to the chief public health nursing administrator. If the administrator agreed, the survey was completed during a scheduled telephone call or another copy of the survey was mailed or sent by fax to the individual.

#### **DATA ANALYSIS:**

No identifying information was connected with any data collected. A code number was used to identify each local health department. The data were analyzed using descriptive statistics. Nonparametric correlation coefficients were calculated between the size of agency (i.e., number of public health nursing positions) and the extent to which evidence was used in practice. Narrative answers to open-ended items were examined to determine patterns.



**FINDINGS:**

Thirty-six (80%) of the chief nursing administrators in the 45 Michigan LHDs completed the survey either by mail (29 participants) or through a telephone interview (7 participants). Of the 36 reporting administrators, 28 (77.8%) reported currently using research and other evidence to support public health nursing services. The correlation between size of LHD and use of evidence was non-significant. Among the eight administrators who reported that the LHD did not use research and other evidence, five reported that from four to eight of 12 public health services were evidence-based. This discrepancy is addressed later.

In response to the survey request to describe briefly the process by which evidence was incorporated into practice, only two participants described a process. Of the two responses, only one was structured enough to suggest that a process was actually in place: "Protocols and policies are written and updated yearly, and the research used is referenced in the manuals." Most responses were examples of sources of evidence (e.g., the CDC or the Michigan Department of Community Health) and descriptions of informal processes, for example, staff read or heard about new evidence. Two agencies indicated that quality assurance was part of the process for EBP.

Six administrators reported having one person or position assigned the responsibility for implementing evidence-based practice, and 11 participants reported between 10% and 90% of an individual's time was devoted to implementing evidence-based practice. One participant stated that no one individual was responsible, and this participant was unable to determine the amount of time used to implement EBP. Another participant reported that EBP was an ongoing process that started with the health officer, the medical director, and the nursing administrator.

In response to the question regarding how research was incorporated into public health nursing practice in the department, 78.6% (n=22) of 28 participants reported that policies were based on research and other evidence; 92.9% (n=26) reported that protocols were based on evidence; 60.7% (n=17) reported that nursing programs were developed around research findings; and 96.4% (n=27) reported that nursing services incorporated practice guidelines.

For the 28 participants who reported using evidence, three (10.7%) estimated that almost 100% of practice was based on evidence. For the remaining 25 participants, varying amounts of practice were reported to be based on evidence: four (14.3%) estimated that less than 10% of practice was based on evidence; four (14.3%) estimated between 11% and 20%; four (14.3%) estimated more than 20% but less than 50%; two (7.1%) estimated about 50%; six (21.4%) estimated more than 50% but less than 75%; and seven (25%) estimated that about 75% of practice was based on evidence.

On a list of 12 services or programs (see Figure 1), participants reported that their LHD provided a range of these services. Examples of the services were teen pregnancy prevention, immunizations for low-immunized populations, and directly observed therapy. One LHD provided none of the services, and one LHD provided all 12. Twenty participants reported that their LHD provided eight or more of the 12 services.



One survey question was designed to elicit the sources of evidence or research used in each agency. A total of 40 sources were listed by the participants. Among the sources identified were national, state, and local agencies, e.g., the Centers for Disease Control and Prevention (CDC), the Michigan Department of Community Health; professional organizations, e.g., American Nurses Association; and individuals including university faculty members, grant funded programs, and literature.

Ten administrators (35.7%) reported using a model to implement evidence-based practice. The model reported most often was the Minnesota Department of Health, Public Health Nursing Model. Twenty-five of the 36 administrators indicated an interest in learning more about EBP. Twelve participants ranked their first interest as continuing education programs about specific evidence-based interventions for public health nursing. The second highest ranked activity was development of a model for incorporating EBP into agency policies, procedures, protocols, and/or guidelines.

Nine participants stated that obesity was the leading public health problem in their communities. Smoking was indicated by eight administrators as the leading problem. Infant mortality was ranked by five participants as the leading public health problem. Since some participants indicated more than one problem, a total of 42 problems were listed (see Table 1).

## **DISCUSSION:**

In order for individuals or entities to move past Roger's (1995) first stage of evidence-based practice, they must advance from the abstract acknowledgment (knowledge) of the innovation to the incorporation of the innovation into action plans to guide practice. The chief administrators of public health nursing services in Michigan LHDs reported a high level of evidence use in practice. Seventy-eight percent reported using evidence in practice, and 50% of the participants estimated that 50% or more of practice was based on research or other evidence. Eight administrators reported that they did not use evidence in practice, but later indicated that specific services were evidence-based. This discrepancy may be a result of ambiguity in the questions or confusion about what constitutes evidence-based practice and services. Some participants replied that they did not know if the guidelines, protocols, and procedures were based on research or other evidence. When a procedure was transmitted to a local health department from the state or a federal agency, participants pointed out that the evidence base of the procedure was usually not included in the written material.

In this exploratory study no specific definition of evidence was provided to the participants, except the statement: research or other evidence. Providing a hierarchy of levels of evidence may be appropriate in future studies, but could have distracted from obtaining usable data in this study. If participants did not know whether evidence was used or not in their agency to support practice, they likely would not have been able to identify the level of evidence used in policies, procedures, and clinical practice guidelines. To examine the level of evidence used in LHD public health nursing services and its appropriateness as a basis for practice decisions is a needed step in this area of research.



The large variety in the approaches that LHDs used to incorporate evidence into practice and services needs more exploration. It seemed clear that guidelines from other agencies, such as the CDC and the state health department, were used by most of the local health departments. However, the actual processes used to assure current nursing practice based on these guidelines and evidence were not clear. The fact that only two participants described an actual process could indicate that evidence was not being systematically incorporated into practice and services by almost 95% of the local health departments.

With only six administrators reporting that they have a person or position responsible for implementing evidence-based practice, it is unclear where the responsibility lies. If all staff members are responsible for reading and incorporating evidence into practice, as was indicated by some participants, no one person may be monitoring for consistency and relevance, or ensuring that policies, procedures, and guidelines are updated on a regular basis to incorporate new knowledge.

Leading problems identified by nurse administrator participants can be viewed as indicators of the issues faced by LHDs throughout the state of Michigan. Problems such as access to primary care, funding for services, and lack of transportation point to long-standing economic-related issues. Local health departments are continuously faced with problems that effect health but are not directly funded for public health delivery, such as providing transportation for clients to health facilities. Because of funding streams and limitations, LHDs may not be able to address leading health problems even though they are identified and documented. The struggle for LHDs to keep abreast of traditional public health services, such as communicable disease control, while trying to focus on prevention is an ever present burden. Evidence-based practice might assist public health nursing administrators to identify realistic priorities that fit within current and future funding streams.

The limitations of this study must be acknowledged. A procedure or method for evaluating the “evidence” was not specifically defined or provided to the participants as a frame of reference in answering the questions. Instead the introduction to the survey included the definition of EBP as cited in the first sentence of this paper. A general definition was given to participants because no research has been conducted that would suggest a commonly held understanding of “evidence” among public health nurses. It is common for state health departments to produce recommendations, guidelines, and standards for practice. These documents may be rarely, if ever, questioned from a scientific perspective by the LHD. Additionally, the guidelines may be modified due to local implementation and funding issues.

It is probable, therefore, that participants used more or less strict interpretations of what constituted evidence and the relative importance of evidence in changing or guiding practice. It was clear from the responses that the chief nursing administrators were familiar with the current evidence-based practice movement in nursing. However, the ability to conduct an in-depth literature review that included analysis of the level and strength of the evidence likely differed widely across participants.



## **RECOMMENDATIONS FOR FUTURE STUDY AND PRACTICE:**

The need to use public health resources as judiciously as possible begs for the increased use of evidence in public health nursing and other professionals' practice. How this may be accomplished is not evident from the results of this descriptive study. Studies are needed to examine the models used by agencies to keep practices current and based on evidence. This is work that would assist investigators to design studies that test the effectiveness of various models of incorporating evidence into public health practice. The next step is to conduct studies that focus on the details of how models and processes are used to guide the implementation of evidence into practice. Another approach would be to review protocols and practice guidelines to determine if and how evidence is being used. Projects also are needed to examine the sources of evidence for policies, procedures, and guidelines being used in local health departments. The need for all guidelines to have documentation of the sources of the evidence was obvious from this survey of chief nursing administrators.

In the instances where LHDs assure services rather than provide them, it is important to ascertain what role nurse administrators could or should play to be confident that evidence-based services are being provided by others. For example, are private providers following CDC guidelines for treatment of pregnant women diagnosed with syphilis? Are primary care providers testing children for lead poisoning on the recommended schedule? If the guidelines are not being followed, what is the role of the LHD and the public health nursing administrator in facilitating the improvement of practices to achieve recommended standards?

In order to increase the dissemination of EBP in public health nursing, nursing administrators could attend workshops provided on the process of translating research into practice and bring the information back to their agencies. One part of the knowledge is how to efficiently search the literature. The administrators could also work with the state health agency to ensure that the level and strength of the evidence are included in each guideline, protocol, and procedure disseminated by the agency.

The need for positions to support translation of evidence to practice was clear in this study. Public health nursing administrators need to advocate for funding for such positions. Sharing one position among a few LHDs would ease the fiscal burden for small health departments. Some LHDs are already partnering with university faculty to assist with the tasks related to EBP. Expansion of such cooperative ventures could benefit both service and education.

The last group of recommendations for practice relates to dissemination of information about EBP. The lack of published review articles about EB interventions in public health nursing hinders the efforts of researchers and public health nurses. This is an area in which collaboration between education and practice could also advance the cause. Dissemination of evidence through the literature, presentations, and meetings could add momentum to efforts to reach all LHDs. Continuing education programs and inservice education sessions for staff are means available to most LHDs for disseminating new knowledge and skills to the public health nursing community. These should continue to be vehicles for increasing the use of evidence to promote quality public health nursing services for the citizens of Michigan.



## CONCLUSION:

Evidence-based nursing practice holds the promise of improving the quality of care and reducing costs (Brooten et al., 1999; Heater, Becker, & Olson, 1988). Without information to direct the development and testing of models of evidence use in public health nursing, little progress may be made to reach the goal of basing nursing practice on evidence. Since the 1970s, nurse leaders have advocated for nursing practice based on research. With a growing shortage of registered nurses, evidence-based practice could provide one means for improving the deployment of a reduced public health nursing work force.

Expansion of evidence awareness in nursing has coincided with the development and widespread use of such World Wide Web innovations as Google, online searchable health care literature databases, and the Cochrane Database of Systematic Reviews, among other innovations that have streamlined access to evidence. However, the time lag from discovery of new knowledge to full application in practice is estimated to be as long as 17 years (Brooten et al., 1999). This time lag for incorporating evidence into public health nursing practice could mean years of unneeded client and population suffering and increased costs to society. There is some indication that innovation is diffusing at an increasing rate in public health nursing. Oppewal, Lamanna, and Glenn (2006) found that after only two years two-thirds of PHNs were aware of the *Core Competencies for Public Health Professionals* developed by leading national organizations in public health practice (Quad Council, 2003) and that 70% of the PHNs indicated that they used the competencies in their work. The current study of the use of EBP in public health nursing demonstrated a similar adoption pattern. For both innovations, nearly three-quarters of the PHNs surveyed stated that they not only were familiar with the innovation, but were at Rogers' Stage 4 (implementing the new idea). Further, research is necessary to confirm the extent of actual change in services, practices, and programs based on evidence.

If nursing is to decrease the time from knowledge discovery to application, realistic models of evidence-based practice need to be explored. Current nursing service organizations do not have funds to undertake large-scale additions of new resources or new positions dedicated to EBP. However, new models may provide information for innovative ways to use current or shrinking resources to meet the goals of evidence-based practice and, thereby, improve both the quality and quantity of public health nursing services.



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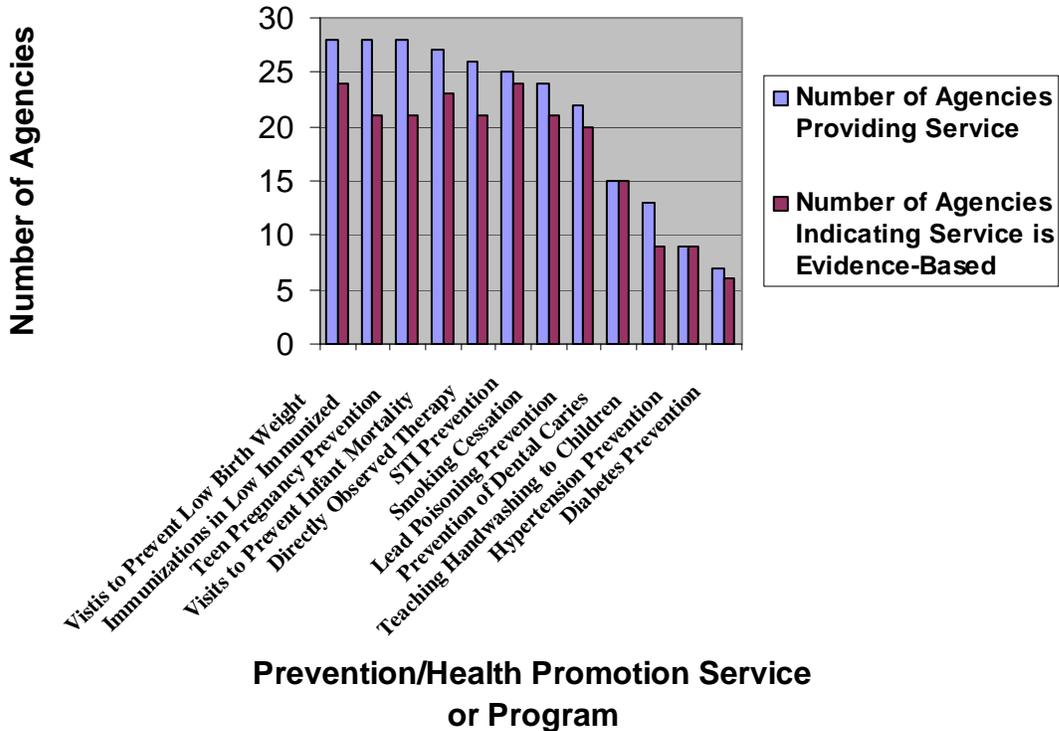
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**Figure I. Agencies Providing Public Health Service and Number Indicating the Service Is Evidence-Based**



**Table 1:***Public Health Problems Identified by Public Health Nursing Administrators*

Public Health Problem	Number of Administrators Identifying the Problem in their Communities
Obesity	9
Smoking	8
Infant mortality	5
Teenage pregnancy	3
Access to primary care	2
Primary prevention	1
Lack of oral preventive care for children	1
Sexually transmitted infections	1
Lack of adequate completion of immunizations	1
Detrimental lifestyle choices	1
Reducing health risks, e.g., infant mortality	1
Funding for services	1
Domestic violence	1
Alcohol abuse	1
Transportation	1
Substance abuse	1
Need for comprehensive school health programs	1
Lead poisoning	1
Hypertension	1
Renal disease	1
Total	42

