

A Public Health Nursing Research Agenda

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ABSTRACT Public health nurses (PHNs) use many interventions to prevent illness and promote the health of populations. Unfortunately, generating evidence regarding PHN practice is not explicitly identified as a research priority area of the major national funding agencies. Nor has PHN, as a profession, had a strong enough research agenda to drive practice improvement on a population-level and to drive funding to support such areas of research. To further advance the science needed to guide PHN practice, a national conference to set the research agenda was held in October 2010 with grant support from the Agency for Healthcare Research and Quality. The conference was part of a multimethod, participatory, multistage approach taken to generate the final research priority themes and corresponding priority research questions. The process yielded four high priority PHN research themes: PHN intervention models, Quality of population-focused PHN practice, Metrics of/for PHN, and comparative effectiveness and PHN outcomes. As the agenda is adopted by funding agencies, researchers, and practice-based partners, a more focused program of research will produce evidence that can guide population-focused PHN practice.

Key words: models, public health nursing, quality, research priorities, safety.

Public health nursing (PHN) is recognized as a nursing specialty, with a professionally established scope and standards of practice (American Nurses Association [ANA], 2007) and competencies (Quad Council, 2003). The key defining characteristic of PHN is population- and systems-level practice (American Nurses Association [ANA], 2007). Many of the types of interventions and contributions made by public health nurses to prevent illness and promote health across populations are not, however, explicitly identified as research priority areas of major national funding agencies which focus on individual level outcomes. Nor has PHN as a profession had a strong enough research agenda to drive practice improvement on a population level and to drive funding in support of priority areas of research. The Association of Community Health Nursing Educators (ACHNE) has worked to establish and advance a research agenda related to PHN

(Association of Community Health Nursing Educators [ACHNE], 2010) that would support and advance the PHN specialty focus. To further these priorities in advancing the science needed to guide PHN practice, a national research agenda setting conference was held in October 2010 with grant support from the Agency for Healthcare Research and Quality (AHRQ). In this article, we report on the process by which a set of high priority research themes were identified, as well as describe corresponding key research directions within each theme. We conclude by providing recommendations for advancing the scientific agenda.

Challenges to Public Health Nursing Scholarship

Four main challenges exist for advancing public health nursing as a population-focused, evidence-based

practice. These challenges are artifacts of history, but are not insurmountable with conscious effort. Briefly, each challenge is described in relationship to its role in advancing evidence in support of PHN practice focused on the population and systems levels of practice.

One challenge is that public health nursing practice is predominately situated in the public health system, not the medical care system. Being part of the public health system *de facto* gives PHN practice less visibility than the much larger numbers of their nursing counterparts in other individually oriented health care specialties (Bureau of Labor Statistics, 2011) and less status, as reflected in lower salaries (Edwards, Wattoff, & Issel, 2010). The PHN researchers (or potential researchers) therefore, need to find colleagues with whom to create empirical synergies, such as scholars in public health systems research and practitioners interested in practice-based research. The promising field of public health services and systems research is still emerging as a relatively new area of research along with its even newer development of formal public health practice-based research networks (Scutchfield, Mays, & Lurie, 2009). Unfortunately, being part of a nascent field of study means that there are fewer research supports in place, whether intellectual, financial, or methodological, especially in comparison to research related to clinical treatment or other areas of health services.

A corresponding second challenge is that public health nursing practice is deeply embedded within a multidisciplinary and collaborative context. This embeddedness refers to a PHN practice that naturally functions through interdisciplinary collaborations and community coalitions and that is based in organizations broadly encompassing a diverse set of workers—including those not overtly considered health professionals, such as sanitarians. Most, if not all, public health nurses would argue in support of the benefits of this reality. Yet, representing one health discipline among a diverse team of public health professionals can cloud and confound empirical issues. The interdisciplinary nature of PHN work makes it difficult to link the knowledge base, skill set, and other characteristics unique to PHN practice with specific outcomes of actions focused on populations.

Another challenge is that public health nursing practice has been increasingly shifting from an

individual/family focused practice to a more population/systems focused practice (Zahner & Gredig, 2005). This shift is consistent with the tone of the American Nurses Association [ANA] (2007) PHN scope and standards, and requires a corresponding shift in PHN scholarship and research. The shift to a population-focus requires conceptualizing and measuring both the nature and quality of PHN practice at a population level, as well as the population-level outcomes the practice intends to affect (Issel & Bekemeier, 2010). The current environment of linking acute care reimbursement to a minimum quality of clinical care and denial of payments for adverse events has created a strong incentive for hospitals and hospital-based clinicians to develop a broad research agenda focused on safety and quality and—more specifically—generate data sets with outcomes sensitive to nursing care. There is not yet a PHN counterpart to the programs of research on nursing's role in providing safe acute care in a hospital setting (Friese, Lake, Aiken, Silber, & Sochalski, 2008; Van den Heede et al., 2009).

A fourth challenge is that public health nursing has been relatively invisible as a specialty among funding agencies. A review of membership lists for various advisory committees that set funding priorities reveals a dearth of PHN scholars on those committees. Being inactive among key decision making bodies has the consequence of further invisibility of PHN in the larger system of research funding and priority-setting and exacerbates difficulties in accessing intellectual, financial, or methodological research support. Contributing to this challenge is the general paucity of research that would reinforce the value of funding population level research. The scarcity of population-level or population-focused PHN research makes it difficult to break the cycle of invisibility and generate support for funding in this area.

A key step toward overcoming these challenges and addressing the issue of minimal national understanding of PHN practice and workforce issues as an important avenue of empirical scholarship is the development of consensus on a research agenda which can be adopted by funding agencies and can establish an iterative program of PHN research. Similar work was done through the AHRQ in setting a research agenda related to hospital acquired infections (Stone et al., 2010). ACHNE was thoughtful in its approach to developing the

most recent research agenda for PHN and reinvigorated the need for additional focus on further developing an evidence base for practice. The ACH-NE process, however, was internal to its membership and was derived exclusively from a PHN perspective. Given the multidisciplinary nature of PHN, involvement of members from the broader public health services and systems research community—including nurses, health professionals and scientists from other disciplines—would be beneficial to further advance the scientific agenda of PHN. This was accomplished via a national, invitational conference held in October 2010 and described below.

Process to Develop the Agenda

A multimethod, participatory, multistage approach was taken to generating the final research priority themes and corresponding priority research questions. The process began by hosting an invitational conference bringing together 50 multidisciplinary experts from around the United States for a structured, working consensus conference focused on the relationship of the quality, safety, and costs of population-focused PHN interventions to population health outcomes. Conference planning was conducted through participation of an eight member advisory committee made up of experts in the field of PHN research and public policy making. The focal areas of quality, safety, and cost were chosen for their relationship to the trends in health services and public health services and systems research. The goal of the consensus conference was to outline a set of research questions which would stimulate population-level and population-focused research, leading to evidence-based PHN interventions that improve population health outcomes.

The conference design included invited papers reviewing state-of-the art research and methods in PHN and areas applicable to advancing PHN research (Table 1). In facilitated small discussion groups, participants explored gaps in existing research, barriers and issues. At the end of the conference, an all-participant consensus-building process was used to generate a draft set of research agenda priorities in terms of research themes and their related topics or research questions. Following the conference, the themes and questions generated by the participants were condensed and refined into

a set of eight priority areas. In doing so, duplicate questions were eliminated, and a few were combined based on their similarities. For each priority area, a brief theme statement was developed by participants as a whole.

To maintain, but continue to refine, the spirit of the suggestions from the October 2010 conference participants, a round table session at the November 2010 annual meeting of the American Public Health Association (APHA) was held. The roundtable was devoted to obtaining further input from public health nurse researchers and practitioners. The session started with a 20-min summary of the consensus conference and the themes from the consensus conference that were discussed. The approximately 35 participants, then self-selected into five groups, each led by a predesignated facilitator. Facilitators were asked to assist each table group in reaching consensus on the relevance and importance of the identified themes and generating additional key research questions, as desired. At the end of this session, there was widespread support for the themes identified in the AHRQ process, and suggestions for how to proceed in meeting the priorities identified in the themes.

Following the APHA session, the last step in the process consisted of inviting the October 2010 consensus conference participants to rank the eight themes with regard to priority of addressing the research topics and conceptually clarifying questions falling under each theme. All consensus conference participants were electronically sent a ranking survey. A total of 15 surveys were returned (32%), all from senior nursing faculty in attendance at the consensus conference. The rankings were used to drop themes and corresponding research questions that received the lowest rank. This resulted in retaining the four highest priority themes, each with a subset of high priority research question foci. These themes and topics make up the identified research agenda intended to guide PHN researchers and research funding priorities related to PHN population-focused practice.

Various factors and circumstances may have influenced both the process by which the research agenda was developed and the agenda itself. Most notably, there are period effects in terms of when the conference was timed. Specifically, the date of the conference coincided with both the National Institute of Nursing Research holding a celebration

TABLE 1. *Matrix of Topics Addressed at the Conference*

| Presentation titles | Presenter | Affiliation |
|--|---|---|
| Introduction | Kristine Gebbie, Dr PH, RN, FAAN Joan Hansen Grabe Dean | Hunter-Bellevue SON Hunter College CUNY |
| Outcomes focus | | |
| Outcomes from PHN | Pamela Mitchell, Ph.D., RN, FAHA, FAAN Professor | SON, U of WA, Seattle, |
| Population-focused Interventions: State of the Art | | |
| Conceptual models for population-focused PHN interventions and outcomes | Jeri Bigbee, Ph.D., RN, FNP-BC, FAAN Jody DeMeyer Endowed Chair | Department of Nursing Boise State University |
| Existing nursing intervention and outcome databases | Karen Monsen, Ph.D., MS, RN Assistant Professor | SON, U of MN |
| Existing non-nursing databases for studying PHN processes & outcomes | Doug Scutchfield, MD Professor | SPH, U of KY |
| Quality focus | | |
| Quality of care for population-patients from PHN Interventions: State of the Art | Amy Rosen, Ph.D., MSW Professor | SPH, Boston U |
| Existing conceptual models for understanding quality of PHN care | Linda Olson Keller, DNP, RN, BC, FAAN Clinical Associate Professor | SON, U of MN |
| PHN interventions and quality of PHN care | Rita Munley Gallagher, Ph.D., RN Independent Contractor | National Center for Nursing Quality, American Nurses' Association, |
| Methods/databases for studying quality of population-focused PHN care | Robin Newhouse, RN, Ph.D., NEA-BC, CNOR Associate Professor and Assistant Dean | SON, U of MD at Baltimore |
| Safety focus | | |
| Safety for population-patients from PHN Interventions: State of the Art | William Riley, Ph.D. Professor, Associate Dean | SPH, U of MN |
| Conceptual models for understanding safety of PHN care | Pat Stone Ph.D., MPH, RN, FAAN Professor | SON, Columbia U |
| PHN interventions and safety for population-patients | Shawn Kneipp, Ph.D., ARNP Visiting Associate Professor | SON, U of NC at Chapel Hill |
| Databases/methods for studying safety of PHN population-focused care | Ron Bialek, MPP Executive Director | Public Health Foundation |
| Contexts focus | | |
| Costs and PHN Interventions: State of the Art | Jack Needleman, Ph.D. | SPH, U of CA at Los Angeles |
| PHN Research and Health Care Reform | L. Michele Issel, Ph.D., RN | SPH, U of IL at Chicago, |
| Current Priorities and Setting Agencies: AHRQ's Process | Mary Hand, MSPH, RN Health Scientist Administrator | Agency for Healthcare Quality and Research |
| Strategizing to Get Where we Want to Be | Glen Mays, MPH, Ph.D. Chair, Department of Health Policy and Management | Fay W. Boozman College of Public Health, U of AR Medical Sciences |

Note. SON=School of Nursing; SPH=School of Public Health.

of its 25th anniversary, and the Robert Wood Johnson Foundation, in conjunction with the Institute of Medicine releasing of the 2010 *The Future of Nursing*, (2010). More broadly, the conference was held during the economic downturn which began in late 2007. The economic environment likely poses special challenges for maintaining the research funding base of both federal and private granting agencies.

Four High Priority Themes

Table 2 is a summary of the final four public health nursing research priority themes. The four identified themes prioritize an agenda for PHN research and cover a breadth of topics. Each theme is defined with attention to how the theme fits within existing PHN research and trends in public health research. For each theme, three to five specific key research foci that were ranked as high priority questions through this process are described.

Public health nursing intervention models

Current status. At the heart of any health professional practice are the interventions conducted and the models theoretically justifying those interventions. Given a dearth of PHN intervention studies at the population and systems levels, research that tests interventions based on sound theoretical models at these levels of practice should be a high priority. ACHNE's recent review of 485 PHN-related research articles from 2000 to 2006 revealed that only 3.9% of the articles addressed development of mid-range PHN practice theories (Association of Community Health Nursing Educators [ACHNE], 2010). This lack of theory to guide population-focused research and the corresponding gap in an evidence base for population-focused PHN practice needs to be addressed to strengthen the future of PHN practice.

The shortage of evidence for interventions delivered or led by public health nurses at the population and/or systems levels is offset by the growing number of studies available to guide PHN practice with high risk groups at the individual level. Examples include studies documenting improving the effectiveness of hypertension control in Black men using community outreach by Hill et al. (2003), alcohol reduction interventions using motivational interviewing by Nyamathi et al.

(2010), and HIV/STD prevention studies conducted by Jemmott, Jemmott, and Fong (1992), Jemmott, Jemmott, and O'Leary (2007), Jemmott, Jemmott, Fong, and Morales (2010), some of which were conducted using randomized clinical trials. The HIV/STD prevention intervention developed and tested by Jemmott and colleagues is recognized by the Centers for Disease Control and Prevention (CDC) as one of the *Best-Evidence Interventions* for use in public health practice (CDC, 2011) because of its demonstrated efficacy at the individual level and soundness of evidence on effectiveness when translated into community settings (Jemmott et al., 2010). The next logical step would be to test the use of effective individual-level models in producing population-level outcomes. Extending the evidence from these studies to population-level public health nurse-led interventions would be one approach to generate evidence-based population-level and focused PHN interventions.

Research agenda. This research theme broadly included research questions focusing on development and testing of specific models of PHN practices, with the intent of identifying which models are most appropriate under which conditions. The high priority topics related to PHN intervention models are: developing and testing population-focused interventions, delineating the public health nurse unique role in conducting core public health functions, and communicating relevant findings to policy makers and the public.

Evidence-based population-focused interventions. The choice of an intervention for use at the individual level of practice ought to be driven by the existing body of research showing that an intervention is effective. This same approach applies to population-focused practice. As discussed above, the science in support of population-focused PHN interventions needs development, including development and refinement of research designs.

Essential public health nursing interventions for optimal population health. Most of the models and frameworks for public health nursing practice (Bigbee and Issel, 2012) do not specify direct connections between an intervention and an optimal population outcome. A major focus of the research agenda focuses on determining which

TABLE 2. *List of Research Themes with Definitions*

| Theme | Definition. Explanation | High priority questions per theme |
|--|--|--|
| Public Health Nursing Intervention Models | <i>Delineating and testing conceptual models that inform & direct PHN practice.</i> These research questions focus on development and testing of specific models of public health nursing practices, with the intent of identifying which models are most appropriate under which conditions. | <ul style="list-style-type: none"> •What are the population-focused, evidence-based practice interventions for PHN that lead to quality outcomes? •What PHN interventions are necessary for optimal population health outcomes? •What is the PHN role in overall accountability for public health core functions? •What models exist for public health nurses to effectively communicate with policy makers? |
| Quality of Population-Focused Practice | <i>Conceptualizing and operationalizing quality of PHN practice.</i> These research questions use a variety of approaches to delineate the parameters, dimensions, and characteristics that are indicative of the level of quality of PHN practice, particularly with regard to population-focused services. | <ul style="list-style-type: none"> •Does PHN practice that incorporates assessment of the home, work, community and other social-ecological environments improve practice quality? •What is the relationship between healthy communities and the quality of PHN practice? •Which workplace organizational practices influence the quality of PHN practice, and how? |
| Metrics of/for Public Health Nursing | <i>Developing and harmonizing databases relevant to PHN decision making.</i> These research questions focus on identifying specific indicators (variables) that are sensitive to PHN practice, that describe PHN practice, and that can be reasonably collected and maintained in standardized databases for later use in decision making by PHNs and other public health professionals. | <ul style="list-style-type: none"> •Which data elements are essential to be in a minimum data set to measure PHN practice and outcomes? •What are PHN-sensitive outcome indicators at: 1) individual, 2) family, and 3) community-population levels? •Which metrics related to PHN practice and outcomes are reliable and valid and at what levels? •How can current databases be used to improve quality and safety of PHN practice? |
| Comparative Effectiveness and Public Health Nursing Outcomes | <i>Exploring the relationship between PHN interventions and population health outcomes.</i> These research questions use a variety of independent variables indicative of interventions used by public health nurses, moderating variables related to the public health nurse, and dependent variables specific to a population health outcome. | <ul style="list-style-type: none"> •Which population outcomes are sensitive to variations in PHN interventions? •What is the cost-benefit or the cost-utility of employing public health nurses as part of a multidisciplinary team? •Which PHN interventions improve health outcomes of special populations (i.e., low wage workers, immigrants, female workers, diabetics) when conducted at the workplace or population-focused venues? •What is the added value and/or unique, synergistic population-level effects of having public health nurses on multidisciplinary teams in public health systems? •What is the added value and/or unique, synergistic population-level effects of having public health nursing involved in providing selected health programs compared to other types of personnel? |

interventions are necessary to achieve desired population health outcomes, and greater specificity of the PHN characteristics and roles required for a successful outcome. Put another way, generating research that can answer questions regarding what unique “added value” PHN may bring to population health and how that differs from other health department personnel with different disciplinary backgrounds and different levels of education. Narrowing the focus of the research topic to identify necessary interventions begins to establish the essential elements of population-focused PHN practice.

Public health nursing role in accountability for core public health functions. The core public health functions of assessment, policy development and assurance (Institute of Medicine, 1988) pervade the strategic planning of health departments and are the basis for local and state public health department accreditation criteria. This research topic asks what is the role of PHN and the contribution of PHN in carrying out the core public health functions. Understanding the contribution of PHN to the overall public health enterprise is at the heart of this topic.

Communicating effectively with policy makers. Some models of public health nursing practice include policy as an overall intervention (e.g., the Minnesota Wheel). No model exists, however, that specifies how to most effectively communicate both research findings that delineate the contributions of PHNs, and the potential consequences of policy decisions on population outcomes. Such a model must be tailored to PHN and incorporate a body of research.

Quality of population-focused public health nurse practice

Current status. Public health nurses provide population-focused care (American Nurses Association [ANA], 2007). Care focused on a population, rather than on an individual, requires conceptualizing the quality of care as a population-level construct (Issel & Bekemeier, 2010). The few existing models of PHN interventions tend to broadly encompass both individual and population level interventions (Keller, Strohschein, Lia-Hoagberg, & Schaffer, 2004) or parallel the ten essential public

health services (Smith & Bazini-Barakat, 2003). None articulate or specify the “appropriate” delivery of any one intervention. Without more specificity, development of standardized indicators of quality of PHN care is problematic, leaving public health organizations and the public with no means to determine the quality of PHN care provided. Understanding the quality of PHN care must also take into account that PHN interventions are affected by important cultural considerations (Koniak-Griffin, Logsdon, Hines-Martin, & Turner, 2006) at the population-level.

Measuring quality of nursing care requires having indicators of performance. Needleman, Kurtzman, and Kizer (2007), in their review of efforts to identify a set of nurse-sensitive measures of performance, highlight the challenges of this task for inpatient care. The challenges include: having various conceptual frameworks for measurement, demonstrating an association of factors with measures of nursing process or patient outcomes, establishing at what level (i.e., nurse or work unit) outcomes ought to be measured, and having difficulties in data collection. The challenge of identifying comparable measures sensitive to PHN care provided to populations in the community are further complicated by two factors. One factor is having a greater number of potential confounding factors and causal paths to health outcomes for communities and populations. The other factor is having neither third party payers nor nursing professional associations focused on improving PHN quality of care.

Research agenda. This research priority then encompasses research topics using a variety of approaches to delineate the parameters, dimensions, and characteristics that are indicative of the level of quality of PHN practice, particularly in terms of outcomes for populations. Considerable work is needed first to define and then operationalize the concept of quality as applied to PHN practice which is population-focused (Issel & Bekemeier, 2010). The consensus conference participants noted that parameters, dimensions, and characteristics of quality must be established with regard to populations as the focus of PHN practice and related outcomes. Additionally, the relevance of theory for evaluating the quality (Sidami, Doran, & Mitchell, 2004) of PHN care and

practice remains a gap that needs to be addressed and that the expert participants identified. Three high priority research topics emerged from this process and fall within the quality of PHN practice theme.

Quality as breadth of assessment. A fundamental nursing practice activity is assessment. A line of research exists in terms of determining whether the breadth of assessment is a factor related to the quality of PHN practice. In other words, does incorporating assessment of the home, the workplace, community and other social-ecological environments of specific populations improve the quality of PHN practice? Existing models of PHN practice tend to cast a wide net in terms of what public health nurses ought to assess, from parameters of individual health status to epidemiological trends. That range of what is assessed has not been linked to the quality of PHN practice.

Quality as effect on community. A basic question that has not been answered is “what is the relationship between healthy communities and the quality of PHN practice?” The emphasis of this research theme is on whether variation in quality of PHN practice can be linked to variation in community and population health outcomes.

Quality affected by public health nursing workplace factors. Variations in acute care nursing practice and quality of nursing care have been associated with organizational factors (e.g., Meraviglia et al., 2008). For example, Friese (2005) found that oncology nurses with adequate staffing and resources were seven times more likely to report high-quality care in their institutions ($p < .01$) than those who reported inadequate staffing and resources. A comparable body of research focused on the work environment of public health nurses is needed. Such a body of research could then be used to create organizational and workplace environments supportive of high quality PHN practice.

Metrics of/for public health nursing

Current status. Most public health agencies do not routinely or systematically collect data on outcomes from specific PHN interventions, with the possible exception of data collected related to nursing care provided to individuals in primary care

clinic settings (Kaiser, Farris, Stoupa, & Agrawal, 2009) or under a protocol for a very specific public health program such as the Nurse Family Partnership (Olds, Sadler, & Kitzman, 2007). Arguably, one of the most extensive health information systems developed to track clinical nursing interventions and related outcomes, has been developed through Mosen and Martin’s (2002) Omaha System and is used by many local health departments to track clinical outcomes for specific PHN interventions (Martin, 2005). This system, however, has been used largely for measuring activity related to one-on-one interventions and the outcomes of these interventions with individual clients (Omaha System, n.d.). While the Omaha System remains underutilized as a means for identifying specific outcomes sensitive to PHN interventions, it is limited in its ability to track the broad range of PHN activities practiced at a population-level. Studying PHN outcomes relies on having and using valid and reliable PHN-sensitive outcome classifications systems that can detect the contribution of PHN services delivered at a community or population-level.

Some limited tools exist to potentially measure more proximal outcomes related to population-level PHN interventions such as those activities related to coalition-building and community health promotion. Cramer and colleagues, for example, developed and tested the Internal Coalition Effectiveness instrument to measure the ability of an existing coalition to address community level public health issues (Cramer, Atwood, & Stoner, 2006). But no tool has been widely used for tracking PHN services delivered at a population level and no related health outcomes have been attributed to these.

The harmonization of existing and growing databases developed for describing local and state public health systems over time is underway among public health systems researchers and public health leaders (Center for Public Health Services and Systems Research, (n.d.)). Nonetheless, these data systems are currently not sufficiently nuanced to capture the practices or contributions of PHNs. Kurtzman, Dawson, and Johnson (2008) reviewed existing health care databases and reporting systems for tracking care, safety, and quality; all of which are used for care provided in acute care facilities. Their exhaustive review did not mention any comparable databases or reporting systems for organizations providing PHN care and population-focused care.

Research agenda. The research topics that emerged from this process focused on identifying specific indicators (variables) sensitive to PHN practice. Four key research topics were identified as priorities.

Determine the data elements in a minimum data set that capture practice and outcomes. Research is needed that identifies the minimum set of data elements which would be capable of detecting outcomes sensitive to PHN practice, as well as describing PHN practice. The data elements must be reasonably collected and maintained in standardized databases for later use in programming and policy decision-making. A single or set of relevant databases or a specific minimum data set with a standard variable identification system with query-enabled keywords for nursing and public health systems researchers would greatly advance our understanding of PHN practice and would provide direction to public health leaders and policy makers.

Determine which outcome indicators are public health nursing-sensitive at multiple levels. Issel, Bekemeier, and Baldwin (2010) in collaboration with public health nursing leaders in practice settings have done preliminary work to identify potentially relevant outcome indicators that are sensitive to multiple interventions at the individual, family, and community/population levels and to practices that vary across agencies. "Tremendous" variation exists across health departments in terms of the services they provide and the level (individual, family, population) at which the interventions are focused (Erwin, 2008). Indicators will likely be needed that can delineate between the impact of PHN interventions at each of these levels of focus.

Establish validity and reliability of the essential public health nursing data elements. The reliability and validity of metrics identified as outcome indicators will vary relative to the individual, family, or population level of a PHN intervention. For more proscriptive PHN interventions and those more likely to be performed at the individual level, like those indicators monitored through the Omaha system or through the Nurse Family Partnership, some valid and reliable measures have been developed (Martin, Norris, & Leak, 1999). Valid measures of PHN population-level interven-

tions that can reasonably predict a valid population-level outcome have not yet been identified. As the nature of public health work and PHN practice is rapidly changing (Lenaway et al., 2006), estimating the reliability of these measures is also complex.

Use existing databases to improve quality and safety of public health nursing practice.

The data managed by Centers for Disease Control and Prevention in relation to the National Public Health Performance Standards Instruments and the emergence of a national system for the accreditation of public health systems (Corso et al., 2010; Public Health Accreditation Board, 2006) present possible opportunities for PHN research, despite these database not being specific to PHN. The PHN researchers might be able make use of emerging databases developed through these processes, as well as participate in the evolution of these systems. Such participation can help to assure that emerging data will be capable of filling the existing data gap for improving the quality of and assuring safety in PHN practice by specifying health professional disciplines and supporting the examination of the practices of nurses within the public health team.

Comparative effectiveness and public health nursing outcomes

Current status. The Institute of Medicine (2009, p.1) defined comparative effectiveness research (CER) as "the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat and monitor a clinical condition, or to improve the delivery of care." The intent of CER is to aid in making informed decisions that will improve health care at both the individual and population levels. CER is recognized as an important step toward improving health and developing an evidence base for practice. The development of CER is predicated on having alternative approaches or interventions to be compared, as well as having specific health outcomes associated with those interventions. Both of these aspects of CER need to be more explicit and consistent elements of PHN research.

Research agenda. Under this priority, research questions use a variety of independent vari-

ables indicative of interventions used by public health nurses, of moderating variables related to the public health nurse, and of dependent variables specific to a population health outcome. Four research topics emerged as high priority.

Population outcomes sensitive to public health nursing interventions. This research topic focused on linking interventions which would be distinctly classified as PHN interventions to resultant population outcomes. The relationship between CER and “PHN-sensitive” population-level outcomes is neither unidirectional nor linear – each will inform the other as the PHN research agenda is actualized. For example, having a base of scientifically sound, PHN-sensitive population-level outcome measures would allow researchers to minimize measurement error and understand how changes in PHN “dose” in intervention delivery through CER affects population outcomes with greater precision. On the other hand, because a base of PHN-sensitive population outcomes does not exist, CER studies can help identify areas of population-level health that are most sensitive to changes in the configuration, intensity, and/or duration of PHNs in delivering interventions at all levels of care.

Cost-benefit or cost-utility of having public health nurses. As budget crises continue across the nation, public health nurses are losing jobs (Erwin, 2011; National Association of County and City Health Officials [NACCHO], 2010) as well as health departments losing PHN positions. This has been in part because of a lack of evidence showing whether or not the cost of having a nurse on a team is off-set by savings in other areas and in health gains. Monetization of the benefits and costs of using public health nurses is needed, with particular attention to the outcomes achieved through PHN practice.

Effectiveness of interventions with special populations and provided in specialized population environments. Comparative effectiveness research is yielding useful findings regarding optimal interventions for individual level outcomes (cf, AHRQ). A comparable line of research is needed to understand which PHN interventions are more effective with which special or vulnerable populations and under which conditions.

Effectiveness of having public health nurses on multidisciplinary teams compared to teams without public health nurses. This research topic directly addresses the multidisciplinary challenge mentioned previously. The value of public health nurses’ contributions to the work of multidisciplinary teams needs to be better understood as one avenue into understanding how key synergistic effects are achieved in public health.

Effectiveness of having public health nurses, compared to other health professionals, involved in selected health programs. Doing comparative effectiveness studies which use public health nurses and nonpublic health nurses would begin to address the knowledge gap identified by this research topic. There is overlap in this research agenda focus and the topic related to PHN interventions, in that an emphasis on CER provides a number of opportunities for PHNs to generate the evidence needed to determine the unique contributions of public health nurses in delivering interventions and population health outcomes. Head-to-head comparisons of interventions with and without PHN roles, and/or comparisons of different levels or intensity of PHN involvement (e.g., some measure of PHN “dose”) based on CER studies are needed to understand what they may uniquely contribute to improving population health outcomes.

Next Steps

This research agenda needs to be adopted by funding agencies and researchers. To assist in its adoption, two other papers in this issue provide further insights and details on aspects of the research agenda. One paper explores the metrics and data systems theme, with attention to building upon existing resources (Monsen et al., 2012). The other paper reviews key PHN intervention models, highlighting areas in need of theory development and research (Bigbee and Issel, under revision). The set of papers provide a sound foundation describing the current state of affairs with regard to PHN research, and will hopefully stimulate a next generation of PHN research related to population-focused practice.

One challenge that remains is determining whether and how areas identified in this research agenda align with existing priorities of research

funding agencies. The PHN investigators and their interdisciplinary teams will have the responsibility of assessing the current funding landscape, making this determination, and developing novel strategies for aligning their proposals within the funding priorities in a way that makes PHN and population-health outcomes highly relevant to the members of scientific review panels. Members of the PHN research community also need to argue for the importance of population health as a critical area for developing specified funding streams, participate in funding review panels, and utilization of this agenda in their own discussions with funder. Moreover, they can work to disseminate the research agenda widely through personal communication, press releases, committee membership and utilization of grantwriting. Sharing the agenda with colleagues from other public health, medicine, health education, health psychology, and public health systems research would be an important element of the dissemination.

The most obvious next step is to use the research agenda to guide or inform an individual's program of research. By connecting the research agenda with existing funding priorities, it is possible to initiate research that begins to address the research agenda. Lastly, the research agenda could be incorporated into doctoral PHN education through course or curriculum development.

By actualizing this research agenda, PHN scholars could potentially contribute to an understanding of how to improve health and reduce population health disparities by advancing the evidence-base regarding the outcomes of their own practice and influencing related health policy. The PHN research agenda, if actualized, would thereby proactively contribute to the effectiveness of the public health systems and create healthier communities.

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