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***Panel 1: Achieving population health through
meaningful use: How do governmental public
health agencies view the process to date?***

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My name is Guthrie Birkhead and I am the Deputy Commissioner for Public Health at the New York State Department of Health (NYS DOH). Thank you for the opportunity to speak this morning on the opportunities and challenges presented to State health departments and other public health agencies in aiding providers in achieving meaningful use (MU) of Electronic Health Records (EHR). The perspective I bring to you today is that of the public health practitioner in a State Health Department where we have the statutory authority and responsibility to collect key health information on individuals to guide immediate public health program responses, for example to follow up on a reportable communicable disease case, and also to aggregate individual health data to better gauge the health of the population to guide and evaluate public health programs and policies. We also have a role to communicate critical public health information, for example diagnosis and treatment of diseases of public health interest, to practitioners, local public health departments and the public.

At the New York State health department, we have recognized the importance of gathering electronic data in the three areas of interest today: clinical laboratory results of public health interest, childhood immunizations, and emergency department syndromic data, for over a decade. We have invested a tremendous amount of effort and funding to develop these systems. We now have in place universal electronic systems that achieve data collection in all three areas with a degree of timeliness and accuracy that generally meets our current programmatic needs. For example, New York's Electronic Clinical Laboratory Reporting System (ECLRS) annually collects hundreds of thousands of clinical laboratory results on reportable communicable diseases to trigger follow-up field

investigations to determine the source of infection and prevent further spread. In the recent H1N1 pandemic, New York's syndromic surveillance system collected on a daily basis the number of emergency department visits for influenza-like illness from almost all EDs in the state, providing vital situational awareness of where the pandemic was in the state and which communities were being impacted. And New York's Immunization Information System (NYSIIS) is utilized by over 90% of pediatric providers in New York to record childhood immunizations. We have invested a lot in assuring the quality of the data we are receiving in these systems and understanding their timeliness. These systems are in use everyday driving, guiding and informing our public health programs. I would point out that these systems are working today for the most part without any direct link to patient electronic health records.

That said, we recognize the tremendous opportunities offered by tapping into patient electronic health records (EHRs) for public health reporting and data aggregation purposes. For example, in the reportable communicable disease programs, access to EHR data could provide additional clinical information like symptoms and data of illness onset that is normally only collected through intensive field work by public health staff. In syndromic surveillance, the ability to pull final diagnosis and other detailed clinical information like laboratory test results from the emergency department EHR could greatly improve the granularity and specificity of the data, which are now crude and non-specific. In the immunization registry area, we know that it is a barrier for providers to use the immunization system which is separate from their office information systems and EHRs if they have them. The ability to move data on immunizations from provider EHRs

to the state registry and back again, would greatly improve the utility of the system to pediatric providers.

Current advances in HIT today, such as the collection, aggregation, and transmission of EHR data, offer tremendous opportunities for improvement in public health practice and population health. Public health agencies have and must continue to assess their internal infrastructure, policies, and workforce capability to determine how best to integrate HIT into programs, policy and practice. To benefit from the opportunities HIT offers, significant changes will be necessary in (1) current public health information technology infrastructure and procedures, (2) public health law, regulations, and/or policies, and (3) workforce IT and data management and analysis skills.

First a quick overview of what is before we move on to what can be. Under traditional public health surveillance we begin with a patient seeking medical care. Next clinical findings and clinician diagnosis are documented in the medical record. A laboratory or other diagnostic test may be ordered to confirm the clinical confirmation. Both the healthcare provider and laboratory determine if the suspected or confirmed disease, condition, or organism is on the current list of diseases or conditions that are reportable to public health. Reporting of the disease/condition/organism by the laboratory and or healthcare provider is made via paper, telephone, and fax or electronic means to the State health department and in turn the local health department where the patient resides. The local health department initiates appropriate follow-up according to NYSDOH/CDC guidelines. Follow-up activities may include contacting the healthcare provider for additional information as necessary and interviewing the patient for

information that was not available from the provider. Patient level data is reported to NYSDOH; de-identified data may be reported to CDC (e.g., nationally-notifiable diseases). Traditional public health reporting, as described above takes time, with a typical reporting lag-time of days to weeks. New York has and will continue to implement technologic advances that permit efficient, effective, and secure transfer of confidential healthcare information that is necessary to ensure the health of the public.

State Priorities that Impact Public Health

Rapidly expanding healthcare and public health data and information systems development require an effective and dynamic information management approach to accomplish appropriate, expedient, and user-friendly access to trustworthy data necessary to improve public health practice and the health of the population. Disparate (e.g., paper and PC-based, and point-to-point) data collection, management, and exchange approaches will not be sufficient to meet the needs of public health programs.

These factors have created a need to move public health information management to the next level – one in which information stores are planned and designed to interoperate and deliver information quickly, completely and in the correct and consistent context. This information must support public health objectives and allow different programs to communicate and share data in a common vernacular. Information development initiatives and enhancements must be prioritized based on public health impact, return on investment, executive support and synchronicity with a Master Plan that clearly defines public health information strategies and priorities.

New York's Public Health Information Infrastructure

In New York we have more than 50 unique data collection systems for reportable conditions to ensure both accuracy and timeliness of information reported to us. These systems are part of the NYSDOH infrastructure which is comprised of three domains, each tailored to the specific information exchange needs of the intended audience: the Health Information Network (HIN) is the web 'portal' by which Local Health Departments (LHDs) gain access to data; the Health Provider Network (HPN) is the portal by which the clinical/health provider organizations access the system and the Health Alert Network (HAN) is a third domain that provides health alerts for Public Health Preparedness for both the HIN and HPN. Together, these systems comprise the Health Commerce System, an integrated and user-friendly portal for accessing a variety of public health applications available to state and local health department practitioners. Both the HIN and the HPN are web portals that can be accessed anywhere in the State where web services are available. However, these systems are not currently interoperable with commercially-available electronic health records.

New York's Electronic Data Systems

New York currently receives data from multiple health partners and has the ability to analyze and receive data and provide feedback to LHDs, hospitals, healthcare providers and other partners. However, none of the systems currently in place connect directly to EHRs. The current NYSDOH electronic data systems used for public health activities listed in the Final Rule EHR Incentive Program are:

- 1. Electronic Clinical Laboratory Reporting System;**

2. **Syndromic Surveillance; and**
3. **Immunization Registry.**

Each of these systems is described below:

1. Electronic Clinical Laboratory Reporting System

New York Public Health Law and Codes, Rules and Regulations require licensed clinical laboratories to report all pertinent facts to public health authorities whenever an examination on a New York resident is performed to determine blood lead level or reveals evidence of a reportable communicable disease, lead poisoning, HIV/AIDS, cancer, or congenital malformation.

NYSDOH had invested more than \$10 million over eight years in the statewide Electronic Clinical Laboratory Reporting System (ECLRS). As an early adopter of Health Level 7 (HL7), Logical Observation Identifiers Names and Codes (LOINC), and Systematized Nomenclature of Medicine (SNOMED) standards, ECLRS was developed to utilize these standards. We will, however, need to enhance our internal processes and provide training to staff to transition from HL7 2.3 TO 2.5 messaging as outlined in Stage 1 meaningful use for electronic laboratory reporting to public health.

ECLRS provides laboratories that serve New York State residents with a single electronic system for continuous, secure and rapid transmission of this information to the New York State Department of Health (NYSDOH), all 57 county health departments and the New York City Department of Health and Mental Hygiene (NYCDOHMH). There

are currently 193 laboratories reporting. They access the HPN to submit data by either direct data entry via a secure web page or uploading an ASCII or HL7 data file. Results are immediately made available to the appropriate local health departments and NYSDOH program public health practitioners via the HIN.

In addition to improving timeliness and completeness of reporting, ECLRS has enhanced public health surveillance by improving the accuracy of reports, which facilitates the identification of true emergent public health problems. However, limited clinical information is available through laboratory reporting. Since the public health follow-up for additional clinical information from the provider is a resource intensive, manual process for both healthcare and public health, a recommendation would be for the EHR transmission to include data in common to these reportable conditions and work toward providing disease-specific data, based state and national standardized report forms.

2. Syndromic Surveillance

Syndromic surveillance monitors real-time health-related data that precedes diagnosis. The overlying goals are to:

1. Monitor general community health trends and track level of disease, like influenza, in the community.
2. Identify an outbreak sooner than physician and laboratory reporting. Characterize the geographic and temporal spread of an outbreak after initial detection.
2. Provide objective evidence that an outbreak may not be occurring.

3. Help sustain a strong ongoing relationship between public health and clinical medicine and increase communication.

All emergency departments in New York State (NYS), excluding New York City (NYC), are required to participate in the New York State Department of Health (NYSDOH) syndromic surveillance system. NYSDOH used CDC preparedness funding to establish the capability in the hospital setting to transmit emergency department (ED) data to NYSDOH. We currently collect patient level (ED) data from 142 of 144 total hospitals. Data are de-identified but include the patient's medical record number should re-identification be necessary. The data, which can include HL 7 messages, are transmitted from the hospital EDs via ECLRS. New York routinely monitors Fever, Respiratory, Gastrointestinal (GI), Asthma, Neurological, Rash, Carbon Monoxide Poisoning, and Hypothermia syndromes. New syndrome definitions, such as heat-related healthcare visits, are created and monitored on an as-needed basis. The estimated state population, excluding NYC, is 11 million. Approximately 98% of ED visits are captured by the system.

Statewide Medicaid sales of over-the-counter (OTC) and prescription medications are also reported to the NYSDOH. This data, grouped into 18 drug categories, is reported to the NYSDOH syndromic surveillance system and is monitored daily. Medicaid covers 34% of the NYC population and up to 20% of the residents in the 57 counties outside of NYC.

These data are continually analyzed to assist with the earliest possible identification, monitoring, and response of disease outbreaks or other events of public

health significance. Results of our analyses including, long and short-term trend graphs and patient listings by syndrome, hospital, county and region, are available for viewing by local and state public health on the HIN and participating hospitals on the HPN. New York also reports daily its fever syndrome counts to DISTRIBUTE, the syndromic surveillance project under expansion by CDC to provide a more comprehensive and detailed situational awareness of geographic and age-specific patterns of influenza-like illness.

Actual uses of syndromic surveillance in NYS include:

- Identification of pertussis outbreaks by analyzing prescriptions for selected antibiotics.
- Monitoring of seasonal and pandemic influenza and influenza-like illness trends in the community.
- Retrospective and prospective data review when investigating suspected outbreaks. Lack of supportive evidence has been able to increase public reassurance about the existence or magnitude of the event.

At a minimum, NY needs to continue to receive on a daily basis, from all hospitals, patient level data, including medical record number, to continue our current operations. The ability to receive additional data elements, such as discharge disposition and diagnosis, when available could improve the specificity of our analysis.

NY is prepared to receive HL7 2.3 messages from hospitals. As with ECLRS, we would need to enhance internal operations to process HL7 2.5. New York does not currently have a mechanism to receive syndromic surveillance data from individual

medical providers. The amount of data that public health will likely receive from the private setting may be an initial challenge in terms of processing, validating, analyzing, and interpreting the data. Further development of detailed standards for clinical data related to public health as well as standards for aggregation of data for public health purposes is urgently needed in order to integrate these standards in EHR systems and health data exchange.

3. New York State Immunization Information System (NYSIIS)

The New York State legislature passed the Immunization Registry Law, effective January 2008, which requires health care providers to report all immunizations administered to persons less than 19 years of age, along with the person's immunization histories, to the New York State Department of Health using the a web-based immunization information system .

The goal of the immunization information system is to establish a complete, accurate, secure, real-time immunization medical record that is easily accessible and promotes public health by fully immunizing all individuals appropriate to age and risk. Providers have access to consolidated and accurate immunization records of their patients, receive clinical decision support in complying with an increasingly complex vaccination schedule and can use NYSIIS to manage their vaccine inventory.

We have begun to collect immunization data into NYSIIS by batch uploads from EHRs. We currently have certified 56 billing and EHR software vendors representing over 650 practices administering 10 million of the 17 million immunizations reported in the state outside New York City last year to report data to NYSIIS by batch upload.

Additional practices served by these vendors are not yet online because they have older versions of the software or do not wish to pay the vendor for this service. In addition, we are exchanging immunization data with 8 large managed care plans to enable them to calculate immunization quality measures on their insured children. These systems are not yet bidirectional or real time, but we are working to achieve those goals so that providers can benefit from scheduler, practice assessment and other functions built into NYSIIS.

Actions Toward a More Integrated Approach to Data and Information Sharing

In preparation for full implementation of HER and HIT the New York State Department of Health has initiated work on a plan to identify priorities, opportunities, needs and resource demands facing public health in light of rapidly growing healthcare and public health data sources, information technology development, and interoperability standards. We have identified several priorities for public health systems integration including the Universal Public Health Node (UPHN), the Statewide Health Information Network for New York (SHIN-NY); the Child Health Information Integration (CHI²) Project; continued development of New York's Immunization Registry (NYSIIS) and Lead Registry; newborn metabolic screening and newborn hearing screening reporting; and Infectious Disease Reporting integration to include the Electronic Clinical Laboratory Reporting System (ECLRS), the Communicable Disease Electronic Surveillance System (CDESS), the Outbreak Management System (OMS), Sexually Transmitted Disease Management Information System (STD-MIS) and Syndromic Surveillance. In addition we have identified a need to integrate Chronic Disease/Environmental Health Data Systems including the Behavioral Risk Factor

Surveillance System (BRFSS), the Cancer Registry, the Dementia Registry, the WIC data system and the Body Mass Index Reporting System.

While these efforts are in the developmental stage they are acknowledged as critical to New York's future public health information system development and integration to improve the prevention, identification and response to diseases and other threats to the health of the public through access to and sharing of data

The most advanced of these efforts is the Child Health Information Integration or CHI². Using the NYSIIS, the immunization information system platform, we will soon make available to providers all laboratory tests for childhood lead poisoning and the results of newborn hearing screening. The mission of this database is to create a single system that is able to link numerous information systems that contain child specific data. The CHI² project will integrate multiple datasets within various DOH programs serving children in New York. Initially the system will include data from the Statewide Perinatal Data System (SPDS); Neonatal Intensive Care Unit (NICU); New York State Immunization Information System (NYSIIS); Newborn Bloodspot Screening (NBS), Newborn Hearing Screening (NHS); Lead Screening (Leadweb); and New York Early Intervention System (NYEIS). Long-term plans envision incorporating additional data from the Congenital Malformations Registry (CMR), the Statewide Planning and Research Cooperative System (SPARCS), the Women Infants and Children system (WICSys) and Medicaid – EmedNY. (In New York there are at least 22 different datasets that contain information on maternal and child health populations).

This integrated information system leveraging the UPHN, will link child healthcare information across multiple data sources and will result in improved outcomes for the delivery of health care to children. The CHI² Project will create an HIE solution that follows federal and state guidelines for meaningful use and enables consistency when utilizing data which should improve public health function, integration, evaluation and research. The ability to link child healthcare information across multiple data sources will create a number of beneficial outcomes for the delivery of health care to children in New York State, such as identification and monitoring of different child health status “profile” populations; identification and follow-up of individual children with specific health needs; and identification and assessment of public health needs and issues.

By ensuring that partners, including providers and RHIOs, are assured access to a unified data base of child health information available to the state health department, we hope to reduce duplication of effort, provide data sharing capability, and permit data from the emerging EHR systems and RHIOs to be transmitted and received, with the ultimate goal of improving child health. This is the ultimate meaningful use.

Another public health goal in New York that is heavily reliant the ability to exchange health information relates to Newborn Metabolic Screening and linking this screening to long-term follow-up care, assistance and public health program interventions. These interventions involve testing, diagnosis, education, referrals, treatment, and evaluation, extending beyond infancy and requiring extended collaboration and communication among multiple clinical care and public health groups throughout a child’s lifespan. New York has embarked on an ambitious HIE initiative intended to improve the newborn screening short-term follow-up system through

enhanced health information exchange among the newborn screening program, birthing hospitals, medical home/community-based practices, and subspecialists; develop and implement a system of long-term follow-up (LTFU) for Cystic Fibrosis (CF) and the inherited metabolic diseases (IMD) and integrate NBS short and long-term data and information exchange activities within an interoperable, standard model for meaningful HIE. Data from the following systems will be integrated as a beginning to accomplishing this effort: the Statewide Perinatal Data System, which includes the birth certificate, Newborn Bloodspot Screening, Newborn Hearing Screening, the NICU Module, NYS Immunization Information System and the Early Intervention System

Current Experience in New York with Data Exchange with EHRs

In New York we are taking initial steps to foster data exchange with EHRs. We are making a nearly \$1 billion public and private investment in the Statewide Health Information Network for New York, or SHIN-NY, including fostering the development of regional health information organizations. To align with that effort, New York is now testing the Universal Public Health Node (UPHN), a system designed to leverage local health information exchanges across the state for public health functions. While the UPHN is not yet operational, we have begun to collect immunization data into NYSIIS by batch uploads from EHRs. We currently have certified 56 billing and EHR software vendors representing over 650 practices administering 10 million of the 17 million immunizations reported in the state outside New York City last year to report data to NYSIIS by batch upload. Additional practices served by these vendors are not yet online because they have older versions of the software or do not wish to pay the vendor for this

service. In addition, we are exchanging immunization data with 8 large managed care plans to enable them to calculate immunization quality measures on their insured children. These systems are not yet bidirectional or real time, but we are working to achieve those goals so that providers can benefit from scheduler, practice assessment and other functions built into NYSIIS.

The Universal Public Health Node (UPHN), a collection of services and operational policies designed to fulfill designated public health reporting and monitoring objectives, is narrowly intended to describe the relevant interactions between Health Information Exchange partners such as Regional Health Information Organizations (RHIOs) and the New York State Department of Health (NYSDOH). In the larger context, UPHN transactions will support activities and interactions with other entities and health information exchanges, such as local health departments (LHDs) within New York, the Centers for Disease Prevention (CDC), healthcare data sources (e.g. – hospitals, physician practices, etc.), and healthcare consumers. Ultimately, the goals of the UPHN are to streamline health care provider interactions with public health and facilitate the integration of otherwise “siloes” public health information systems.

Lesson’s Learned

New York is fortunate to have successful systems in place that we can build upon as we move to increased use of HIT. Lessons learned that may be instructional for all jurisdictions and as future meaningful use definitions evolve include the following:

1. Public health must adopt standards to assure that our data needs are met within the broader context of EHR development. More specifically, public health uses of

data are important at both the individual patient level as well as in an aggregated form. The ability to aggregate and analyze relies on standard encoding of data and widespread acceptance and adoption of the data standards. Consistent application of standards for reporting of data is critical to ultimate utility of the data.

2. Public health agencies and providers are both stakeholders; agencies as the repositories of the information for use in policy and programmatic development and providers as the individuals faced with reporting the data and to whom consistent and coordinated reporting will result in ease of reporting, reduced duplication and reduced workload. Involvement of all impacted parties throughout the developmental cycle is critical to ensure that the needs of all are understood and to ensure acceptance of new systems.
3. Pilot testing to identify issues, assess data validity, accuracy and timeliness and to apply lessons learned is a critical developmental phase.
4. An incremental rollout plan helps to ensure that appropriate support can be provided to new users and that lessons learned and best practices can evolve.
5. New York's current reporting systems have been extensively validated in terms of data integrity, content and usefulness to the Department. Any new configuration for data collection through EHRs will require extensive validation to ensure that the integrity and content of the data meets Department standards.
6. The number of data provider interfaces associated with each application and the time required to validate each interface is significant and must be accounted for.

For example, New York receives laboratory results via ECLRS from 200+ laboratories. It took a year to validate the data and certify just the first 30 providers.

7. Ongoing communication, comprehensive documentation and training are essential elements for successful implementation. Public health must be prepared to provide user support on public health aspects of data reporting and utilizations. In New York the initial implementation of ECLRS required over 60 training sessions across the state.
8. As these systems continue to evolve they will require ongoing support and maintenance including funding to support these systems during the developmental process. As we look to the future, capturing a significant amount of data, we must consider overhead costs associated with disk storage; data retention and archive requirements and ongoing monitoring required to identify equipment issues and disk storage availability.
9. Data needs to be treated as an asset. Ongoing Data Management activities are needed to review, analyze and conduct quality assurance – all additional costs to system development.

Barriers to Meaningful Use of Public Health Data

Our goal in New York is creation of systems that facilitate effective data reporting, collection and analysis that supports New York’s public health goals as enumerated in our “Prevention Agenda”

(http://www.nyhealth.gov/prevention/prevention_agenda/). The Prevention Agenda” identifies the following ten priorities for improving the health of all New Yorkers:

- Access to Quality Health Care
- Chronic Disease
- Community Preparedness
- Healthy Environment
- Healthy Mothers, Healthy Babies, Healthy Children
- Infectious Disease
- Mental Health and Substance Abuse
- Physical Activity and Nutrition
- Tobacco Use
- Unintentional Injury

Data are available to support and guide some of these priorities but we are a long way from a complete, comprehensive, timely and accurate health care information system that supports all of these goals. For example, while the existing syndromic surveillance system does a good job in supporting community preparedness and response to infectious disease, there is much more that could be accomplished with EHR including the ability to receive additional data elements such as discharge disposition and diagnosis, which would improve the specificity of our analysis. Moreover, as additional information is captured and communicated, the systems for validating, analyzing, and interpreting significantly larger data sets must be revised and improved to meet this challenge.

I would like to highlight three specific barriers as we move ahead to more fully utilize health information exchange with EHRs for public health purposes to achieve meaningful use of health data.

First, public health needs to broaden its thinking on new uses of data which will be available as a result of health information exchange with EHRs. Progress towards achieving public health goals such as reducing obesity, diabetes and cardiovascular disease might be better measured through collecting clinical information from EHRs such as height, weight, diabetic control and blood pressure. At this time, public health chronic disease programs are not equipped to receive or analyze this type of clinical information and have no experience in using such data to inform and evaluate public health programs. New ways of thinking, new analytic techniques to manage this potentially vast amount of information, and additional resources will be needed to achieve these capabilities.

A second challenge is the lack of funding to support upgrading public health data systems to keep pace with the advances in technology. While we are spending billions in New York to develop EHRs, the statewide health information network, and the public health node on that network, the resources to upgrade public health to integrate with these systems are lacking. In addition, current public health data system funding is “siloe” with each discrete program area funded separately for system development and upgrades. Since these categorical funds often come from the federal government, changes in federal funding rules to allow more cross program flexibility will be important. An example is the recent announcement of HL 7 2.5.1. Just in the area of laboratory reporting alone, we have multiple data systems including communicable disease, HIV, childhood lead, and cancer reporting that will need to be upgraded to handle HL 7 2.5.1 messaging. The

ability to collaborate across programs in this upgrade process will greatly speed the process. These systems will greatly benefit from the new world of interoperable systems, but we need to flexibility in our funding streams to “think outside the silo” and to support data exchange development leveraging the efforts of other public health programs.

Finally, it is important to note that existing public health reporting systems will need to be maintained until there are proven reliable replacement systems available. We will need to be assured of the quality, validity and timeliness of new data sources before we can fully transition public health programs to them. As a result, for a period of time simultaneous maintenance of multiple existing systems along with integration of multiple new data streams will be necessary until all data providers are successfully reporting through new data infrastructures. Until the transition is complete, public health reporting for healthcare providers will be both complex and costly.

Recommendations for the Future:

As I have discussed, New York has a significant investment in multiple electronic health information systems. The emergence and adoption of EMR systems and the ability to access those data through health information exchange will open the door to a wide range of data, much of which is currently unavailable to public health agencies, and has the potential for making a significant impact on the meaningful use of these data for public health purposes.

I offer the following recommendations to the committee for you to consider in supporting the involvement of public health in meaningful use of EHR data exchange:

1. Continue to actively engage public health agencies and professionals to assure that HIT goals can be achieved, can be sustained, and are useful for public health program purposes.
2. Develop and promote national standards for health information exchange that have been widely vetted in the PH community. Data standards need to take into account public health data needs, which require both individual level data as well community-level (aggregate), and need to assure that the data are valid, accurate and timely. Resources will be needed to assure the validation of these new data sources and collection methods.
3. Help assure that federal funding for categorical public health programs are flexible enough allow cross-program collaboration initiatives such as New York is undertaking in its CHI² initiative.

Closing

As I think about the technology and workforce changes facing public health, the words of Dr. David Blumenthal, published in the July 13 NEJM article resonate with me: “The speed of ascent must be calibrated to reflect both the capacities of providers who face a multitude of real world problems and the maturity of the technology itself”. Public health needs to be actively engaged to ensure that we do not merely receive EHR data but that the information exchange and resulting data is of acceptable quality and can be managed within the walls of public health such that it supports and improves public health practice. Until this is established, improvements in population health resulting from public health practice will not be possible. Thank you.