

Genomic Competencies for the Public Health Workforce

Source

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Preamble

This set of draft competencies address the performance thought necessary of a composite workforce for “getting up to speed” in integrating genomics into public health practice, in the year 2000 and the imminent future. This competency set is believed to be transitional. Within 5 years, these competencies will need to be updated as research findings, new technologies, and standards of practice evolve. Additionally, any competency set should demonstrate the advanced level of workforce performance needed as public health appropriately advances more mature genomics science and programs.

This draft competency set was produced through a several-step process using all competencies developed by the six public health discipline teams: administrator, clinician, epidemiologist, environmentalist, health educator, and laboratorian. Each discipline-specific set was coded and each individual competency numbered. (A=administrator, C=clinician, E=epidemiology, H=healthcare, L=laboratory, V=environmental) Next all individual competencies were studied to determine common performance themes within the entire competency set and grouped accordingly. Specialists in competency development (both for genetics and public health) then compared and contrasted the competencies within the groupings to explore the intent of the original authors and to compose one competency statement for each message theme.

This draft set of genomics competencies for the public health workforce refers to a composite workforce with overlapping responsibilities. Therefore, to be more useful to each discipline, specific genomics competencies within the set should be selected for each discipline’s professional attention and support. This set of competencies is intended to guide the training and development of public health workers at all levels including local, state, and federal.

Genomics versus Genetics

In editing, where appropriate genomics replaces genetics to encourage readers to expand their conception of genetics. Often genetics is seen as a field, which concentrates on serious single gene diseases, which affect a limited population. Genomics includes the single gene conditions plus common conditions partly caused by genetic mutations such as colon cancer, breast cancer, diabetes and atherosclerosis and common conditions potentially prevented by genetic mutations such as HIV, cancer, and diabetes. Virtually everyone is at risk for a genomic condition.

Competency refresher

Competencies are applied skills and knowledge (blended with behaviors) that enable people to perform work. A helpful formula for writing competency statements = action verb (observable or measurable performance of a worker) + content (subject matter, type of performance, specific task) + context (limitations of conditions of work environment). At our present stage with genomics and public health, the context is often the need for data, training, and preparedness. The new Genomics Competencies for the Public Health Workforce are to be integrated into the total workforce competencies for the ultimate delivery of the Essential Public Health Services.

Analytic (Research) *a breaking up into simpler elements; a systematic inquiry into a subject to discover facts, theories, etc.*

Modify various existing collection data systems (e.g. case reports, registries, and lab results) and identify new sources for capturing data about genetic factors related to the health of the population. A1, E2, E10, V2

Determine appropriate genetic factors (“genetographics”) and implement a baseline surveillance system for diseases and conditions in the population. E28, E35, E36, E50

Perform and analyze epidemiologic studies to determine the environmental factors which interact with identified genes to cause disease. (Environment interactions include behavioral, infectious, and chemical factors.) E3, E33

Recognize and evaluate known gene-environment interactions using population data to determine the significance of environmental factors and potential for disease in targeted populations. H2, V24, V25, V29

Determine or evaluate the specificity, sensitivity and reliability of available and new genetic tests to select the tests with improved performance characteristics. E37, L14, L27, L32, L35, L44

Conduct internal validation studies of laboratory procedures to ensure high quality genomic testing. L1, L7

Evaluate the usefulness of genetic tests in the population to determine their clinical validity and clinical utility (e.g. test performance characteristics in large numbers of people). L33

Design and conduct a variety of scientific studies to determine the importance of specific behavioral, biomedical, and environmental factors that combined with a genetic factor produce disease. A2, A17, A26, C16, E15, E27, L8

Formulate relevant inferences from the scientific literature and determine information gaps to guide research as genomics is incorporated into public health. A8, L5

Monitor and read traditional and non-traditional scientific information sources and use the electronic media to stay informed of the rapidly evolving genomics scientific and medical information. E47, H12, L2

Employ sampling methods to determine the significance of the relationship between genes and environment and calculate the role of genetic susceptibility in disease development. (E.g. asthma, hemochromatosis, early hearing loss) E1, V4, V14, V26, V23, V27

Communication *imparting or exchanging of thoughts, opinions, information by speech or writing, etc.*

Explain and present basic information about the role of genomics in health and disease using standard terminology (e.g. genes, DNA, inheritance,) to the community. E46, L17, L31, V1, V28

Deliver information and prevention messages that are scientifically-based which describe the benefit of altering known causative environmental factors when specific genes are found or suspected to be involved in the risk of developing disease. H5, H11

Inform the general community and targeted audiences about the current laws and their limitations pertaining to participation in genomic research and testing (such as informed consent, confidentiality) and the rationale behind such rules. A5, E19, L18

Articulate the scientific foundations for using population-based genomic data to guide decision-making for target audiences such as legislators, media, health care providers, and advocacy groups. A16, E23, L22

Explain the results of genetic tests in terms of medical/health implications in understandable terms to health care providers, the persons seeking or having been tested, and the affected family unit. E8, L15, L16, L24

Describe the concepts of probability and risk (including uncertain information) for acquiring a disease or condition based on a person's genetic make-up and exposure to linked environmental factors. C2, L21

Community Relations *an association or connection with a social group or members of a specific locality*

Collaborate with civic organizations, advocacy groups, and ethnic, religious and special-interest groups, etc., to support a community-wide dialogue regarding genomic health issues. A4, E29

Build partnerships among the various public health systems, private health care systems, and community support services to ensure the availability of adequate genomic services in the community. E22, L19

Establish reciprocal relationships between public health practitioners and credentialed genetic specialists for making appropriate medical referrals. E12, H8

Construct partnerships with academic, research, private and commercial enterprises in the community to plan collaborative scientific studies to advance population-based genomic research. E45, L20

Policy Development *to adopt an action or procedure for the sake of facility, expediency, etc.*

Identify and promote public policies, statutes, and regulations that effectively address genomic health issues in the community. A10, V15, V21

Monitor and address evolving political, medical, and community issues that may positively or negatively effect the integration of genomics into state and local health departments and agencies. A11

Identify the political, legal, social and ethical issues related to genomic testing, the recording of genetic information, and the integration of genomics into the practice of public health. A12, C10, H16

Identify the limitations of the usefulness of genomic technologies and information at this time and monitor for the misuse and abuse of services and for discrimination and potential harm to the public. E5, V7, V10, V18

Explain the feasibility and expected outcomes of various policy options using genomic epidemiologic and evaluation data from scientific studies and the literature. A14, E32, L28

Identify legal council knowledgeable in genomics and public health and its relation to human subjects protections, confidentiality, privacy, and discrimination to assist with policy development. A21

Monitor changing federal and state genomic testing regulation to facilitate policy development and develop organizational capacity for integrating genomics into public health. L34

Decide when it is -- and is not -- ethically and medically appropriate to incorporate genomic testing into public health practice. V5, V8

Summarize and interpret genomic research methods, population-based data, laboratory testing procedures, and standards of clinical practice to appropriate officials and policy-makers for their use in informed decision-making. A15, C7, E30, L26

Plan and communicate a legislative agenda to ensure the appropriate use of genomic tests, adequate services for all, and avenues of funding while respecting client rights and the informed decision making process. A22, C6

Ensure that public health advisory and regulatory groups such as Institutional Review Boards (IRB) s are educated in the role of genomics in public health and evolving human subjects issues. E34

Program Planning *a coordinated group or list of things to be done*

Plan targeted interventions using qualitative and quantitative genomic data that demonstrates minimizing the risks for adverse health outcomes and the health benefits for persons in the community. A7, V6, V17, V20

Develop specific prevention plans (including budget needs, clear objectives, realistic methods, implementation schedule, and evaluation criteria) for known, preventable diseases and conditions with identifiable genetic factors of major public health importance. A13, C1

Assess the perceived genomic education needs of targeted audiences (policy makers, employers, insurers, providers, purchasers, schools, community organizations, and community leaders, sub-populations at risk of discrimination, sub-populations appropriate for targeted interventions). (A3 repeated) H13, E20

Implement a genomic communications plan (including mass media and web-based) to disseminate culturally appropriate prevention messages to targeted audiences.

Collaborate with universities, professional organizations, and other teaching institutions to integrate genomic education into the curriculum of future health professionals (e.g. human genome epidemiology). E24, H9, H18

Implement targeted screening programs for genomic diseases and conditions that are identified as having cost-effective prevention interventions. E42, E43, L10

Cultural Capabilities *ability to understand the ways of living for groups of human beings*

Deliver quality genomic care by assessing the social, ethical, and religious considerations and recognizing the diverse backgrounds of people to ensure cultural appropriateness and remove personal bias. C5, L29, V11

Assess the impact of societal value systems on the acceptance of interventions as genomics is incorporated into public health. H15

Characterize the effect(s) of cultural beliefs, values, and individual differences on the interpretation and use of genomic test results. V9, V12

Identify the ways in which genetic testing may impact on family dynamics and relationships. V22

Illustrate the negative perceptions and fears of participating in genomic testing and research, which might impede effective implementation. V13

Professionalism *the character, spirit, or methods of persons engaged in an occupation*

Know and translate fundamentals of genomics including common vocabulary of terms, knowledge of genetic disease, patterns of inheritance, role in health and disease, screening, risk/benefit, testing, and recent developments. C9, E4, E7, E17, E41, H7, L30, L31, H6

Identify the limits of one's own genomic expertise and appropriately make referrals for additional expertise to qualified professionals. C17, C24, C26, E6, E25, H14

Contribute to the growth (cutting edge) of one's profession by sharing genomic knowledge and by developing evolving standards of practice for the profession. C8, C12

Participate regularly in continuing education (as needed for the profession) in genomics to apply current and accurate knowledge to the practice of public health. C25, H17, V3, V30, L3

Demonstrate scientific ethics such as informed consent and data confidentiality and prepare for genomic situations which are yet to be encountered and may not be covered by regulations or practice guidelines. C4, C19

Use professional integrity in managing personal information about individuals (includes genetic codes, disease risk factors, and family histories), which may be "sensitive" and may lead to discrimination. L11, L13, V16, V19,

Works effectively within a diverse public health workforce. C18

Basic Public Health Science *fundamental knowledge of the facts pertaining to the health of a population as a whole*

Provide technical assistance to community-based health care organizations by evaluating test performance, initiating screening and detection programs, and developing educational materials. A9

Define the community's genomic-related health concerns and identify the available community services and resources. (academic, private, managed care, not-for-profit, commercial, and public). H1

Assess the community's risk for known and newly identified, preventable diseases and conditions with genetic factors which carry major health and economic burdens (e.g. asthma, heart disease, diabetes...) E38, L9

Assess the role of behavioral, social, cultural, lifestyle, environmental, and infectious factors in the community regarding successful prevention of genomic diseases and conditions and in improving health. C11, H3, E44

Describe the multi-factorial genetic nature of common diseases and conditions (such as heart disease, diabetes, HIV...). H20, L36

Evaluate the effectiveness of prevention measures to determine the health status of populations and the cost-benefit value of interventions. (cost utility, years of life lost, etc.) A32, C13, E14

Integrate the traditional public health and environmental programs to create an interdisciplinary discipline to study gene-environment interactions which impact human health. V31

Leadership & Systems Thinking *to guide or influence an assemblage of members, parts of a whole, or plans*

Modify or create a 5-year strategic plan, which demonstrates the integration of genomics into the mission of the agency (e.g. policy development, educational programs, laboratory testing, research agenda). A18, A25, L23

Ensure that the community needs for genomic services (community needs assessment) are reflected in the public health strategic plan. A6

Initiate the development of a community-wide strategic plan in genomics that describes a shared vision and delineates shared responsibility among academic, private, and other public partners for the health care needs of the population. A19, A20, A23, E9, E21, E48

Demonstrate to collaborative partners and to the community the economic value of targeting interventions to diseases and conditions affecting large numbers of persons. (Return on investment) H10

Promote public health responsibility in genomics and serve as the community focal point for the accumulation and dissemination of current and accurate scientific information about genomics. L38

Management *having charge or responsibility for the affairs of a business*

Coordinate individual and organizational responsibilities within the context of core functions to ensure genomics is integrated into the essential public health services. C14

Monitor confidential records to ensure compliance with professional standards, organizational policies and applicable law and regulation. C22

Manage human resources to facilitate the integration of genomics and develop recruitment strategies to meet the new needs. H19, L47

Identify competencies in genomics needed by all individuals in the public health workforce for the next five years. A29, E13, L46, L48

Develop, implement and promote a workforce training plan to educate public health workers in genomics. A30, E31, E39, E40, H4

Promote cross training of the public health workforce to prepare for the changes brought on by the integration of genomics and the uncertainty of its eventual direction. L49

Develop and monitor performance standards including quality assurance for clinical, laboratory and education genomic services. C15, L6, L25

Participate in and promote external validation studies of genomic testing to assist in determining when a particular test is appropriate to incorporate into the standard of care. E49, L37

Amend current and develop future quality improvement plans to include public health genomic services. A24

Estimate and monitor the costs (monetary and non-monetary) and benefits of current or proposed genomic services. C21, L41

Evaluate and monitor risk-benefit, cost-effectiveness, cost-benefit, cost-utility and utility of current or proposed genomic interventions including screening programs and diagnostic testing. C3, E18, E26, L39, L45

Devise strategies to promote team learning (workplace teams) and interdisciplinary organizational learning for integration of genomics into public health. C20, L50

Financial Planning *the management of money and pecuniary resources*

Forecast an agency-wide budget using available cost data to support the integration of genomics into public health science and programs as prioritized in the strategic plan. C23, L40, L42

Solicit external resources to support strategic genomic health practices in the community (including foundations, government grants, managed-care collaborations, local business sponsorship, and third-party reimbursement). A31, L43, L51

Information Systems *a comprehensive method of ordering information about a particular subject*

Demonstrate and promote a secure, networked data system that collects genomic data from numerous community-based sources to monitor the health status of populations and the genetic determinants of health. A27, E11, E16, L4, L12