Critical Analysis of Contemporary Public Health Genomics and Needs Assessment for Public Health Genomics Course Curriculum

Kim London JD, MPH, Thomas Lamkin PhD, Valerie Martindale PhD, & Nikki Rogers PhD
Department of Community Health, Center for Global Health

Background: Genetics has traditionally garnered more attention in the medical sciences than in public health, due to the individualistic nature of genes. The national Human Genome Project was completed in 2003: the same year the Institute of Medicine recommended inclusion of genomics in public health academia. The Human Genome Project initiated a wave of novel genetic and information technologies that have resulted in increased and unprecedented public health issues. These issues range from increased use of genetics in epidemiological research, to customized, individualized genetic services resulting in the need to ensure that public health policy keeps pace with this rapidly evolving science. Here we examine current genetic science and public health curriculum and assess whether courses are lacking in the area of genetics.

Methods: Genomics literature search and synthesis followed by quantification of number and type of studies, gene sequencing cost and applications trends. Finally, a website search of genetics-related curriculum in U.S. Public Health academic programs was conducted and information was tabulated for interpretation.

Results: Proliferation of Genetic Sciences
- Completion of Human Genome Project & technology advances = lower sequencing cost (Figure 2). National Institutes of Health (NIH) expects lowering trend to continue.
- Lower cost = more research opportunities and accessibility of genetic tests to individuals (Figure 1).
- Decreasing Cost
- Increasing Publications
- Genomics has traditionally garnered more attention in the medical sciences than in public health, due to the individualistic nature of genes. The national Human Genome Project was completed in 2003: the same year the Institute of Medicine recommended inclusion of genomics in public health academia. The Human Genome Project initiated a wave of novel genetic and information technologies that have resulted in increased and unprecedented public health issues. These issues range from increased use of genetics in epidemiological research, to customized, individualized genetic services resulting in the need to ensure that public health policy keeps pace with this rapidly evolving science. Here we examine current genetic science and public health curriculum and assess whether courses are lacking in the area of genetics.

Discussion & Recommendations: The literature analysis evidences an association between lowering cost of genome sequencing and increasing number of published genetic-related studies. This trend has resulted in expanded applications related to public health with no indication the trend will slow in the future. Thus, public health professionals should be aware of the genetic era and students of public health taught related knowledge and skills. The literature review provides ample documentation of leading national health organizations (NIH, IOM, CDC) that have determined it imperative for genetics to be included in public health academia. IOM’s recommendation to include genomics in public health academia was published in 2003. Ten years later, genetics-related courses do not appear to be well represented in CEPH-accredited public health graduate programs. There is opportunity and need to add more genomics related material in public health academia. A barrier to smaller PH academic programs may be limited resources/faculty/students. Incorporating parts of genetic-related information to existing courses, where relevant, will help overcome this barrier.

References: See hand-out reference list.