

Development and Implementation of Genetics to Genomics: A Secondary Education Curriculum to Educate Teachers on the Relevance and Value of Genomics

Mary Teachout, Barb Neureither, Deb Duquette, Janice Bach

Background and objectives: The Michigan Department of Community Health (MDCH) in collaboration with an educational consultant, created, pilot-tested and disseminated a novel secondary education supplemental curriculum, entitled “Genetics to Genomics”. The curriculum highlights chronic disease and health promotion messages using content that matches state and national benchmarks; and is “reachable, relevant and rigorous”, The objectives were:

- To increase awareness in teachers and students that behavioral choices made early in life are important for chronic disease prevention.
- To encourage biology and health science teachers to progress from teaching simple genetics to introducing their students to genomics and its implications for health.
- To increase the relevance of genomics and confidence of teachers in this subject matter

To promote in-service workshops illustrating the use of “Genetics to Genomics”, a presentation was made to 33 directors of the state’s Math and Science Centers which provide professional development for teachers. Of those in attendance, 27 expressed some degree of interest in hosting such a workshop in their region.

Methods: With input from MDCH staff regarding the role of genomics in common chronic diseases, the education consultant developed a web-based curriculum based on her 30 years of experience teaching genetics in high schools. The curriculum includes approximately 45 activities that progress from Family Health History, Multifactorial Traits to Genetic Variation. After the presentation to the directors of the Michigan Math and Science Centers, hands-on workshops were provided by the education consultant and the MDCH Genomics Educator at various sites statewide to demonstrate the curriculum and use of the website activities to classroom teachers. The workshop presentations also included information on the public health impact of common complex chronic diseases. Pre and post-test evaluations were administered and evaluated the teacher’s perceptions of knowledge, confidence and importance of public health genomics. A one year follow up evaluation was also conducted to find out if the teachers were utilizing the web site and curriculum materials in the classroom.

Results: To date, approximately 150 teachers have participated in 13 workshops. Evaluation data showed a significant increase in the mean scores of the teachers’ perceptions of knowledge, confidence, and importance. For example, the pre-workshop average score of perception of knowledge relating to cancer genetics increased by 50% upon conclusion of the workshop. The mean score of knowledge of microarray technology increased by over 120%. Furthermore, an overwhelming 96% of all the teachers rated this workshop excellent or near excellent. More specific data will be given in the poster presentation.

Discussion/Conclusion: The evaluations from the workshops indicated that the hands-on approach to this topic and accompanying public health messages did in fact significantly increase knowledge, confidence, and importance of teaching genomics. An email group has been established and contact is maintained at least monthly with the teachers by the Genomics Educator as a means of disseminating recent research and for general communication.