Journal title: APH

Article Number: 499110

Dear Author/Editor,

Greetings, and thank you for publishing with SAGE. Your article has been copyedited, and we have a few queries for you. Please respond to these queries when you submit your changes to the Production Editor.

Thank you for your time and effort.

Please assist us by clarifying the following queries:

<table>
<thead>
<tr>
<th>No</th>
<th>Query</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Please check that all authors are listed in the proper order; clarify which part of each author’s name is his or her surname; and verify that all author names are correctly spelled/punctuated and are presented in a manner consistent with any prior publications.</td>
</tr>
</tbody>
</table>
Editorial

Genetics and the Future of Public Health

Colin Binns, MBBS, PhD¹, and Wah-Yun Low, PhD²

This year marks the 10th anniversary of the completion of the Human Genome Project on April 13, 2003, an occasion that marked a historical turning point in science.¹ In the decade since then there have been many advances in the application of genomics to clinical medicine as the costs of genetic sequencing has plummeted. It is now possible to use sequencing to assist in clinical emergencies, such as an outbreak of methicillin-resistant *Staphylococcus aureus* in a neonatal intensive care unit.² The scientists who chose to sequence the human genome did so because it was a challenge and because its success would substantially advance the understanding of humankind, biology, and of the science of medicine. A decade later, the benefits of genomics to clinical medicine are just becoming evident. In the next decade, there is little doubt that genomics and genomic medicine will continue to be important to patients, health care professionals, researchers, and society in many ways that we cannot yet imagine.¹ The next decade will see the extension of these new technologies into public health. We even have a new branch of science—“translational research”—a discipline that helps make findings from basic science useful for practical applications that enhance human health and well-being, a discipline that also has its own journal *Science Translational Medicine*.

“The field of public health has always been noted for its ability to put to practical use the basic discoveries of the many sciences which have had something to contribute to public welfare.” This is the way Thomas Snyder began his address to the New York Academy of Medicine when he was delivering an address on “Genetics and Public Health.”³ He then went on to list a large number of topics from physics and mathematics through to behavioral studies and applied disciplines such as the study of transportation and housing, along with the more traditional public health fields of bacteriology, sanitary engineering, statistics, entomology, and veterinary medicine. He made the point in his address that in the future, public health would interact far more with genetics. That was of course before the era of Crick and Watson and before our more recent understanding of the human genome and its variations.

By 1992, Harper was warning the readers of the *BMJ* about public health risks as well as the benefits. He drew a distinction between the benefits of genetic screening. We need to distinguish between population and individual aims where the “goal is to help a specific individual, couple, or family achieve what is the optimal decision for themselves.”⁴ He then reminded the public health audience to take great care with the ethical dilemma that population-wide prevention presents to us.

It is easy to regard the excesses of the eugenics movement, or the abuses in Nazi Germany, as disconnected from present day medical genetics, but a closer look at these chapters (in our history) shows that their

---

¹Curtin University, Perth, Western Australia, Australia
²University of Malaya, Kuala Lumpur, Malaysia

**Corresponding Author:**
Wah-Yun Low, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia.
Email: lowwy@um.edu.my
key feature was the subordination of individual decisions to the broader population based goals. That these goals were often deeply flawed is not the relevant point. Those concerned at the time believed that they were acting in the best interests of the present and future population and that these must override the lesser rights and decisions of individuals. There is a clear danger here for how we judge the success of any population based genetic programmes, and for conflict with any individual decisions that seem to jeopardise such success.\textsuperscript{34}

The same ethical issues remain with us today and deserve further debate within the pages of our journal. The Asia-Pacific region has different cultural, ethical, and religious values as compared with other parts of the world. We need to discuss and debate within the Asia-Pacific Academic Consortium for Public Health (APACPH) and the regional public health community regarding this issue.

The use of genetics in public health is not new. Without the benefits of genomic science we have been able to introduce widespread screening for infant metabolic disorders and the development of epigenetics has provided a theoretical basis for folate supplementation and fortification to reduce neural tube defects. It has been known in public health for some time that the expression of genetic traits can be modified by our environment, the whole basis of trying to elucidate the risk factors for chronic disease in order to implement health promotion programs. Now a new level of genomic science is being applied to this task and a recent review of the interactions of multiple loci for type II diabetes with diet required the efforts of 65 authors from 6 countries.\textsuperscript{5} While the results were interesting they will not have direct application to public health until further detailed studies are undertaken illustrating the complexity of the task ahead.

There are some risks ahead for genomics and public health. As in all newer branches of health science research, standardization of methods and design of research study is an important issue. There is a need to ensure quality of all laboratory methods and we need regional collaboration in the provision of reference laboratories. Cross-sectional and ecological studies need to be replaced with more powerful prospective and interventional studies. We need to ensure that the application of genomics to public health will not just widen the gap between North and South nations and the socioeconomic barriers that exist within countries. These will be challenges for APACPH and our journal.

In this issue of our journal, we bring a selection of articles from a symposium held by the Medical Engineering Branch of Henan Medical Association, People’s Republic of China. They include studies on public health genomics and related fields that will be of interest to our readers. We hope that in the future we will be able to bring further articles on public health and genomics and we welcome letters to the editor or commentaries on this topic.

References