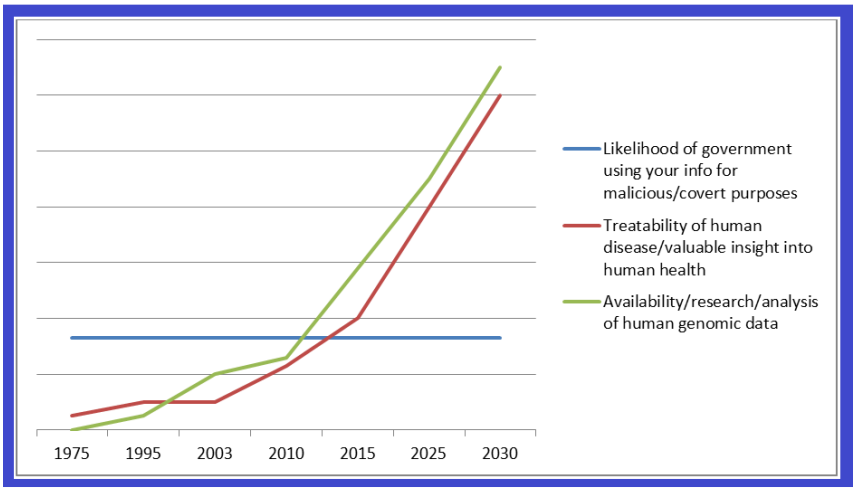
"Modern medicine arose when scientists learned to fight some of the worst infectious disease with vaccines and drugs. This strategy has not worked with AIDS, malaria, and a range of other diseases because of their complexity and the way they infiltrate processes in cells. Curing such infectious diseases, cancer, and the health problems that arise from defective genes will require a new type of medicine based on a thorough understanding of how cells work and the development of new methods to manipulate what happens inside them. The HGP was and is one of the central projects leading to this understanding of how cells work and opening the way for new applications of molecular medicine." -Russ Hodge. 2010. "The Future of Genetics: Beyond the Human Genome."

Scientists are using the reference genome, the knowledge of genome structure, and the data resulting from HPG as the foundation for fundamental advancements in medicine and science with the goals of preventing, diagnosing and treating human disease.In diagnosis of single gene,Mendelian diseases and disorders, genomic tests are being used to accurately diagnose rare diseases many of which were previously misdiagnosed with inappropriate courses of treatment prescribed.Prenatal genetic screening is being performed to inform potential parents of risks for catastrophic inheritable disorders.Using knowledge of predisposition towards specific diseases multiple genes and biomarkers have been identified for predisposition for multiple diseases such as cancers,neurological diseases,psychiatric disease and cardiovascular disease.Inspite of rational drug development new drug targets have been identified.Cancer drugs based on the genomics of tumors are on the market,including Gleevec,Herceptin,Tarceva,Avastin.Potential applications like Therapeutic products custom prescribed based on patients genomics to maximize effect and reduce side effects is already being applied in the treatment of some forms of cancer and cardiovascular disease.Genetic tests are used for dosage levels in prescription of some drugs such as Caumadin.In revitalizing of some drugs shelved in development, successful discoveries of subpopulations for which previously inapproved drugs are efficacious are done.For instance,Iressa has been approved with patents testing positive for the EGFR mutation.Genomic identification is a mean to combat infectious organisms.Hence, multiple infectious organisms have had their whole genomes sequenced.Public health professionals sequence emerging infectious disease organisms to monitor migrations and mutations.After publicized setbacks, gene therapies are now achieving success.For instance, the fatal brain disorder adrenoleukodystrophy has been treated. Besides, the HapMap project and 1000 Genome Project successfully correlated specific genetic variants with disease risk of varying statistical significance implying case control comparisons. Moreover,numerous exome and whole genome sequences are used to reveal disease causing variants. As an example The Cancer Genome Atlas analyses numerous cancer types. Acknowledgement of information encoded by disease- perturbed networks allows new strategies for therapeutics and new approaches to diagnosis. Pharmacogenomics facilitates humans to metabolise drugs ineffectively. There are hundreds of actionable gene variants that cause disease but whose consequences can be avoided with knowledge of their presence.

The HPG may be the most inspiring and disturbing project ever undertaken for it has its own merits and de-merits.Well intentioned people are using HGP to make the world better.Supporters of the project value it as a means of eliminating disease,emotional disorders and other forms of human suffering.Moreover,they consider HGP noble and inspiring which evokes a world bursting with technological hubris,a world where all human beings would be born healthy,and suffering would be decreased.In effect,children may be given genotypes,genetic profiles.Offspring considered grotesque,impaired or offensive may be eliminated.Genetic screening is one of the moral dilemmas our culture will soon face as a result of fast moving genetic research and some foresee that cloning can be used to create new children.

Contrarily, HGP causes ethical, legal and social issues. It's due to how this information is interpreted and used, who would have access to it and how can society prevent harm from improper use of genetic information. Risk of genetic discrimination increases as new disease genes are identified. Other issues include individual and family councelling and testing, informed consent for individual considering genetic testing and use of such test for reproductive risk assessment and making reproductive decisions, commercialization of products from genetic research like questions of ownership of tissues, tissue derived products, patents, copyright, accessibility of data and materials.

The public should understand the meaning of genetic information and health professionals should use their knowledge merely for human well-being. Despite the society's quest to be healthy and happy,scientific research shouldn't cease but be carried ethically for extension in prosperity.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Likelihood of government using your info for malicious/covert purposes
Treatability of human disease/valuable insight into human health
Availability/research/analysis of human genomic data