Opinion

The ethics of benefit sharing


Exploiting nature

There is an almost universal feeling that it would be unfair if a rich country went into a poor country, took out some of its natural resources, made a marketable product and earned vast revenues from it unless the poor country were given something back. It is intuitively straightforward that a nation, company or person should not make money on somebody else's resources without paying for them. When the resources that benefits are made from originate from a country’s natural fauna, flora or metals, the sharing of benefits should bear upon the country or population as a whole, apart from compensating local collaborators for their work in a normal manner. The underlying ethical principle would be that countries should not exploit other countries. In particular, rich countries should not exploit poor countries. If rich countries take natural resources out of developing countries without compensation, it could mean that the economic potential of the exploited countries could no longer be realized when those countries have developed sufficiently to be in a position to exploit their own natural resources.

Exploiting human genetic material

A state of unfairness would also exist if research on genes in a family led to marketable products and revenues for the pharmaceutical industry, unless the family was given something back. If profit results from genomic research on a whole population, the recipient of shared benefits should be the whole population. However, it may be predicted that important new discoveries will often be the result of research on genetic material from a small number of individuals, perhaps even a single person. This will typically be the situation where new disease mechanisms and hence, therapeutic potentials, are discovered in research on a rare disease.

An example of a discovery in genomic research that could lead to new therapeutic modalities is the recent, simultaneous detection by several research groups of the primary defect in Tangier disease. The molecular defect turned out to reside in the ABC1 gene (the gene encoding the adenosine triphosphate-binding cassette transporter 1), resulting in deficient lipid transport through the cell membrane to the outside. Apolipoprotein A-1 particles are then unable to pick up lipids to form a normal high-density lipoprotein (HDL) particle and remove lipids from the tissues. HDL cholesterol (HDLc) is often referred to as the 'good cholesterol'. Tangier disease exhibits a deficiency of HDL. At face value, this would seem to be a research result of importance to only a very small number of patients and that any future profit would therefore have to be minuscule. However, families with a clustering of cases of premature coronary heart disease (CHD) often exhibit reduced levels of HDL, and one of the research groups did in fact find mutations in the ABC1 gene.
in CHD families with low levels of HDLC (1). This fact significantly widens the potential therapeutic importance of the detection of the role of the ABC1 gene. If a drug that compensates for a deficient ABC1 gene were to be discovered, it would not only be a handful of Tangier disease patients around the world that could benefit, but a vast number of people contracting CHD at much too young an age. Thus, the findings in the very rare Tangier disease could lead to discovery of a drug that could benefit millions of patients (as well as the pharmaceutical industry).

Important progress resulting from research on samples from a small number of people ‘personalizes’ the progress in a way that by itself makes it reasonable to consider benefit sharing. This may be particularly pronounced if the people whose samples have led to important new developments are in difficult circumstances with respect to health, financial status or social situation (a family could, for example, have a difficult financial situation for health reasons). Intuitively, it would seem wrong to make profit on the basis of people in need and the urge to share benefits should be particularly strong in such circumstances. If profit is earned on the basis of samples from members of a family with a severe disease problem, which could not have been made without its co-operation, the family deserves some benefit. However, there exists no formula to translate the willingness of individuals and families to co-operate into benefits of any kind.

Categories of benefits

Genomic research could result in several categories of benefit. Improved understanding of disease processes and a potential for new therapeutic modalities are by themselves a benefit. The benefit is there for the whole of mankind as an improved basis of information on health and disease. This benefit is not trivial; progress may lead to therapies that could totally change the quality of life of individuals and families. Important as expansions of the medical knowledge basis are for mankind, specific pieces of new information will be particularly valuable for individuals and families with disorders on which research could lead to new drug discoveries. Thus, new insight is by itself an important benefit, particularly for those who could derive a direct medical advantage from it.

New insight into disease processes from molecular comparisons between healthy and diseased tissues could point to roads of drug discovery that would benefit the pharmaceutical industry. When research progress leads to a new efficient drug for a serious disease, patients in need of treatment and a better quality of life may still have the largest benefit of all. Thus, successful development of new drugs benefits patients, families and industries.

If research leads to the possibility of eradicating an important disease by preventive or therapeutic modalities, it would be of major benefit to the whole of mankind and particularly to those suffering from, or being at risk for, the disease. There would be less suffering and less anxiety.

Yet another kind of benefit could be the provision of free medical service or free medicine to individuals or populations participating in research. For example, it appears that an international pharmaceutical company under contract with a biotechnology company on Iceland will provide the Icelandic population with a free supply of any medicine that may result from research on Iceland under the contract.

Finally, the sales of a patented new and important drug could create very high revenues for pharmaceutical companies for the duration of the patent period.

Practical difficulties in revenue sharing

Even if there were broad agreement on financial benefit sharing with people whose samples had been of importance in profit making by pharmaceutical industries, significant practical problems would prevail. A main question would ask who should benefit. In the case of a handful of families with the very rare Tangier disease (1), it should be reasonably straightforward to share financial benefits with patients or their relatives. This is so because the key individuals would be few and have a reasonably long life span. They could easily be found and given benefits if important new drugs were to be developed soon.

In other cases, the situation could be much more difficult. The expectation would be that in most cases, many years would pass between the original sampling of people and the appearance of a new drug on the market. For each marketable drug, there may have been numerous attempts that did not succeed and therefore did not create revenue. It would be extremely difficult to predict at the time of the original sampling which line of research would succeed.

Creating a rule that financial compensation should be paid to participants already at the outset of a study would be problematic. It would efficiently prohibit university scientists to take part in drug discovery based on genomic research because of the problematic financial situation of most universities; they would simply not have the funds to
pay significant sums at the outset of studies that may lead nowhere. The idea of benefit sharing presupposes that there are some benefits and becomes void if no benefit accrues.

There would be a danger that a system with compensations paid at the outset of studies could result in smaller gains for participants in very successful studies than could otherwise have been the case. Finally, it is possible that fewer projects would move to actual clinical testing if projects taken over from academic groups had significant financial commitments attached.

**Do individuals have a right to shared benefits?**

Intuitively, a person who has provided a sample for genomic or other research, or has otherwise performed an essential task leading to significant revenue, would seem to have a right to benefit from the profit (2). It is, however, not easy to find specific arguments for such a right. For example, the people themselves have not performed any act of competence to create DNA. Thus, they cannot have a right similar to that based on intellectual property or patent acts. Their body has simply synthesized a compound based on hereditary instructions passed on from the parents.

If a person’s DNA becomes ‘valuable’, it would be because of something that researchers have done with it or because of some pre-existing knowledge attained by the work of other scientists at an earlier stage. The people who make a person’s DNA sample valuable must have some stake in it, a right that is more like that of a holder of intellectual property than any right that the donor of the sample could claim. If industry has a duty to pay, the rights of the scientists that have made a sample valuable may exceed those of a person who has merely donated DNA.

Finally, there is no ethical precedence for paying donors of biological material. Thus, blood donors or organ donors are not financially compensated in most Western countries (although they may have their expenses covered). The payment made to sperm donors by some sperm banks does not seem to have an ethical foundation. It is simply the demand for sperms that appears to make payment necessary in some areas.

Thus, there is no long-standing ethical tradition that calls for payment to participants in research projects other than compensation if actual damage is caused. Rules securing study participants’ profits may be in conflict with conventions or guidelines that state that the human body should not be a source of income.

**Revenue sharing versus solidarity**

Until now, the tradition in most countries has been that people participating in medical research projects do so for idealistic reasons. The willingness of the public to contribute to medical progress is impressive in many countries. This willingness to help promote research, health and welfare is of great value and should be fostered. The present focus on the sharing of financial benefits could attenuate people’s willingness to participate for idealistic reasons. Thus, present trends give some reason for worry.

Genetic diseases and genetic predispositions to disease may constitute areas where too much focus on personal financial gains is particularly harmful. Family members share genes and fate, be it for risk of rare monogenic disorders or for common serious disorders such as CHD. If research, even within the pharmaceutical industry, leads to better disease prevention or treatment, it benefits the whole group. People who have volunteered to participate in research benefit their own group, even if they themselves cannot be helped. Many patients realize this and do want to participate even if they see no hope for themselves. This reflects a highly ethical attitude of solidarity with one’s own group and may be seen as an extension of a concept of ‘sharing genes–sharing risks’. Perhaps the extension should read ‘sharing genes–sharing risks–sharing responsibilities’.

Solidarity with one’s own genetic group may be a strong moral duty. This is particularly clear for very rare monogenic disorders where the number of patients and families in the whole world may be small. If the key people who have the gene in question do not want to participate in research, there is no way that the medical situation for the group could be improved. Possessing a key (a gene) to better health in the future for one’s group carries a responsibility to make one’s biological material available for research.

On a background of an ethical principle of solidarity with one’s own group (3), participation in research may be in one’s own best interest and not just a generous gift to science. If one accepts that the human genome is part of our common heritage (4), demands for financial compensation to individual participants in research projects do not seem to have a strong foundation.

The most compelling reason for expecting pharmaceutical companies to provide financial compensation for individuals and families taking part in research resulting in marketable drugs is that such families may have financial and social problems caused by the disease being in the family.
Summing up

Apart from the practical difficulties in finding the proper recipients for benefit sharing, the case for financial compensation to individuals or families may be weaker than previously thought. *Specific*, strong arguments for financial compensation to individuals are hard to find. Thus, the argument that individuals or families could be in need would be valid for any group of patients and the moral obligation to help the needy cannot be stronger because a person or a group of people has participated in research projects.

Although there are numerous problems in compensating individuals or families, and although their possible 'right to compensation' is nebulous, there are strong reasons for communities, private charities and profit-making companies to support people in need, for whatever reason, and for rich countries to help developing countries. The ideal of like opportunities for all is a very strong moral reason to help. Responsible communities have fully realized this and have developed public health systems to take care of everybody, and responsible rich countries are extending significant assistance to developing countries.

Thus, the question of benefit sharing with respect to genomics research and drug discovery based on such research may not be new compared to long-standing ethical notions about a duty to help the needy or to help countries develop. The proposal from the Human Genome Organisation Ethics Committee (2) that pharmaceutical industries set aside a certain fraction of their net revenues for health-promoting purposes in developing countries deserves support.

References