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Is six billion a reason to celebrate?

With the human population reaching the six billion mark, the biomedical research community, among others, should reflect on how well we are meeting the needs of those six billion. Although it is asking too much to see a huge shift in research resources from wealthy to poor countries, the information and knowledge generated by research-rich countries could be better shared.

On 12 October in Sarajevo's Kosevo Hospital, the birth of Adnan Nevic was chosen by the United Nations to symbolize the moment when the human population reached six billion. Can we accept *The Wall Street Journal's* simplistic argument (13 October, "Review & Outlook") that resources are the product of human ingenuity and people create wealth, and therefore "The More the Merrier"? The United Nations has an altogether more pessimistic take on the six billion, reminding us that

"Of the 4.8 billion people in developing countries, nearly three-fifths lack basic sanitation. Almost a third have no access to clean water. A quarter do not have adequate housing and a fifth have no access to modern health services." Not a very merry picture.

A glance at how we reached six billion is instructive. According to the United Nations Population Fund the first billion came very slowly (see graph). From there things speeded up, with the final one billion added in just 12 years! This alarming growth is likely to continue for at least the next 50 years or so. A year from now the six billion will be sharing the planet with a further 78 million people. By 2050, it is quite possible that the human population will reach nine billion.

In which case, if *The Wall Street Journal* and others are right, we should indeed be

rejoicing, as before long we will have more resources and wealth than we know what to do with. What they forget (and cannot dismiss as mere neo-malthusianism) is that most of the six billion have little chance of contributing to the economic engine that drives the developed world forward. Recall that the richest 20% of the human population control 86% of the estimated global gross domestic product and that millions of people survive on about a dollar per day—hardly

for example, gene therapy than epidemiology. Delivering better health to the world's people is a far bigger challenge than simply working out at the molecular level what gene or drug it is that we want to deliver.

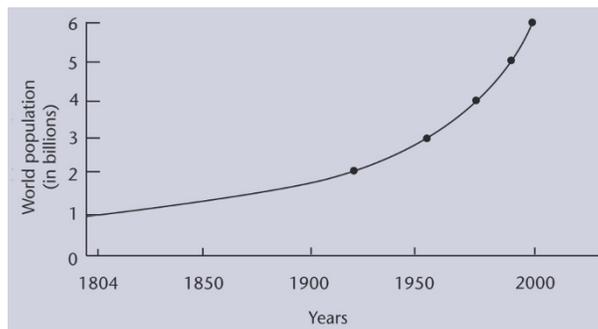
The national agencies and major biotechnology and pharmaceutical groups that fund the bulk of medical research have either a duty or an economic need to investigate those diseases and therapies that are most relevant at home.

As such, it is probably unrealistic to expect a major shift in the allocation of these resources. However, much of the basic research at the heart of the biomedical research community is just as relevant to the issues facing developing countries as it is to those that conduct the research in developing countries. Here perhaps progress can be made by making this knowledge and information more widely available and afford-

able to developing countries.

Even then, basic understanding of disease mechanism is just the first step. It is necessary to develop a parallel understanding of the epidemiological and public health issues—whether scientific, economic, social or otherwise—that must be taken into account when we think of how best to fight disease and promote health. Once again, the lessons learned in wealthy countries are relevant to poorer countries.

The Wall Street Journal concluded its celebration of six billion human beings by arguing that each one of them represents a great opportunity and that each "child comes with not only a mouth but a mind." True, and developed countries must do all they can to make sure both are fed. Then we might have reason to celebrate.



the economic environment in which to "create wealth."

But why should *Nature Medicine*—a journal that is more accustomed to discussing cutting-edge therapeutics than environmental economics—be particularly interested in this issue? Because the gap between rich and poor is never wider than when it comes to medical research spending. The World Health Organization has estimated that more than \$56 billion are spent on health research each year, but only 10% of this is targeted at the diseases that affect 90% of the population.

The biomedical research community must urgently consider how better to serve all six billion and not just the wealthy elite who stand to benefit most immediately from biomedical advances.

A first step may be to question why we as a community pour more funding into,