

The Race Against Drug Resistance

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Over the past decade, governments and private funders have worked tirelessly to increase access to drugs in developing countries, particularly for malaria, HIV, and tuberculosis (TB). Indeed, in recent years the purchase of drugs accounts for up to 40 percent of development assistance from the Global Fund to Fight AIDS, Tuberculosis and Malaria and other major health donors. These welcome efforts have saved many lives—but are short-sighted. The global health community must turn its attention to ensuring both broad access to drugs and lasting effectiveness of treatment. We are losing our ability to cure common diseases to an invisible adversary: the drug resistant bug. Drug resistance occurs when microbes adapt to survive in the presence of drug therapy. Although this is a natural, evolutionary phenomenon, humans have hastened resistance. Across the world, drug resistance is on the rise. A vigorous effort to tackle this problem, the severity of which is little recognized, must start with an immediate injection of leadership from governments, donors, global health institutions, and industry.

Consequences of drug resistance

Drug resistance costs lives, and the consequences can be most profound for children, who are especially susceptible to infectious diseases. The most common childhood diseases in developing countries—malaria, pneumonia, other respiratory infections, and dysentery—are no longer curable by many of the older antibiotics or other drugs available in poor countries. The consequences are devastating: bacterial acute respiratory infections, for example, kill more than three million children every year and malaria kills two million children. Many cases of these illnesses are caused by strains now resistant to common drugs. In wealthier countries, hospitals are reeling from an explosion of methicillin-resistant *Staphylococcus aureus* (MRSA). From 1974 to 2004, MRSA prevalence increased from roughly 2 percent to more than 50 percent of staph infections in many U.S. hospitals, resulting in tens of thousands of deaths. Resistance to drugs also has a startling impact on the cost of curing patients. In many poor countries, expenditures for drugs represent a large proportion of overall health-care costs, ranging from 20 to 60 percent of total expenditure on health. When first-line drugs fail, second-line alternative drugs are almost always far more costly and require greater medical oversight. For example, it costs as much to cure one patient of extensively drug-resistant TB as it does to cure 200 patients of susceptible TB. Where resources are finite or severely inadequate, for every person put on second-line treatment, far fewer people can be given life-saving or life-extending care. The costs of global inaction are borne in the short term by those stricken with a resistant form of disease who lack either access to health services or the money to pay for more costly, second-line treatments. In the longer term, the consequences are shouldered by all of us—and by future generations—who must rely on a shrinking collection of medicines that work.

Commonalities among resistance drivers

There are many drivers—both naturally occurring and human-made—that determine resistance transmission and emergence. Pathogens find numerous ways to survive an attack from drugs designed to kill them; specific disease characteristics also affect the processes through which resistance arises. Drug characteristics, therapeutic protocols, and drug selling and purchasing practices all mediate the relationship between bugs and drugs, and between patient and health-care provider, determining whether resistance will occur. These characteristics vary by disease and environment, but there are also important commonalities in the major drivers of resistance across diseases and drugs, patients and providers. In those commonalities lies the greatest opportunity to identify policy solutions. This report, for the first time, identifies common drivers of resistance across diseases and offers common solutions.

Four critical steps for fighting drug resistance

Over the past decade, the global community has responded to the rise in drug-resistant organisms with a number of disease- or country-specific initiatives. Some have been more successful than others, but none have addressed the problem on a global scale across diseases. The growing threat of drug resistance demands an extensive and systematic global response. A beginning was signaled in late 2007 when the Center for Global Development convened an expert Drug Resistance Working Group to identify practical ways for pharmaceutical companies, governments, donors, and global health institutions to collectively combat global drug resistance, particularly in high-burden diseases affecting developing countries. The recommendations of the Working Group focus on problems created by market and institutional failures and where evidence for successful

action is strong. Taking account of current data and resource limitations, the Working Group coalesced on actions that, taken together, will go far to contain and reduce drug resistance globally. They target four critical areas: surveillance and laboratory capacity; drug supply chain integrity; regulatory capacity; and the technology pipeline. Each has merit individually– but their strength lies in taking a unified, multifaceted approach, with both public- and private-sector involvement. In addition to the four high-priority recommendations described below, the Working Group calls for research and action on several other important aspects of drug resistance not addressed here. In some cases, other reputable organizations are tackling those issues, and in others, the data and evidence needed to understand them are missing. These include the need to quantify the full economic impacts of resistance, understand the effects of using therapeutic drugs to prevent transmission, comprehend the scale and impact of extensive antibiotic use in animals and agriculture, and banish drug counterfeiting.