

# **WORLD HEALTH DAY -APRIL 7, 2011**

## **COMBATING DRUG RESISTANCE:**

### **NO ACTION TODAY MEANS NO CURE TOMORROW**

Can the benefits of miracle drugs be sustained? Antibiotics and other antimicrobial miracle drugs have been extremely beneficial for many of the dramatic advances in human health. Before the introduction of these drugs in the 1940s, infectious diseases took the lives of many millions yearly. One hundred years ago, infectious diseases were the leading causes of death in the United States (as well as abroad). Advances in public health together with the development of antibiotics brought many of these otherwise fatal diseases under control. For example, in 1900 in the US, pneumonia and tuberculosis caused almost one-quarter of all deaths; by 1990, both these illnesses caused less than four per-cent of all deaths.

Initial gains were primarily in higher income countries and among wealthier populations in poor countries. Over the past two decades poor countries have gained access to drugs that combat major killers, including malaria, pneumonia and diarrhoeal diseases. Yet, these gains are in jeopardy. Drug resistance is becoming more severe and many infections no longer respond, leading to prolonged and expensive treatment and greater risk of death. For example, drug resistant superbugs like Methicillin-resistant Staphylococcus aureus (MRSA) are unaffected by traditional antibiotics. As a result, penicillin and its derivatives are increasingly obsolete. Childhood pneumonia, dysentery, and tuberculosis no longer respond to first-line antibiotics in some parts of the world.

The World Health Organization (WHO) is sounding the alarm and has chosen combating antimicrobial resistance as the theme for this year's World Health Day. Its message is "no action today, no cure tomorrow". Global health and untold million are at risk.

As microbes adapt, antimicrobial resistance is a natural phenomenon. Resistance is exacerbated by the widespread use, overuse, underuse and misuse of these drugs. In an article in the current Journal of the American Medical Association, the authors estimate that as much as 50% of antibiotic use is not necessary or inappropriate. Even when the drug has been correctly prescribed, patients who fail to finish the course of treatment are promoting resistance. In some parts of the world prescriptions are not even required and can be purchased over the counter.

Alexander Fleming, co-discoverer of Penicillin in 1929, warned about the possible future misuse of antibiotics in his Nobel Prize lecture in Stockholm in 1945. His warning has not been heeded.

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Two developments have made the problem even more difficult:

One is the massive use of antibiotics in agriculture and secondly, the increased reluctance of drug companies to develop replacements. Approximately half of the current antibiotic production is used in agriculture to promote growth and to prevent crop disease as well as to treat sick livestock. With such massive use, drug-resistant bacteria generated in animals can be then later transferred to humans in food. . Antibiotics, are frequently given to healthy animals to encourage faster growth. This is of course convenient to the farmer because of faster growth it also provides cheaper meat. However, it also provides more opportunities for bacteria to evolve into drug resistant strains.

Attempts to ban the specific agricultural uses of antibiotics have been unsuccessful . Faced with vigorous opposition in Congress by the agrobusiness and farm-state legislators/lobbyists, the Federal and Drug Administration (FDA) has never implemented its proposed limits on antibiotic use in agriculture.

Secondly, in the past drug companies have coped with anti-biotic resistance by developing new drugs. In recent years however drug companies have not developed replacements. They claim that ‘investing in antibiotics is ‘not attractive’ Drug companies are shifting their research dollars to developing drugs that treat chronic conditions such as diabetes and high blood pressure. These drugs are less challenging to bring to market than antibiotics from a regulatory standpoint and are much more lucrative because they are used for years rather than days or weeks as is the case with antibiotics . Furthermore, much of the drug resistance currently is in poor countries that cannot afford flashy new drugs. Between 1983 and 1987, 16 new antibiotic drugs were approved by th FDA. Since 2003 only seven and since 2008 only two have been approved.

The Infectious Disease Society of America (IDSA) has put forward a plan 10x20 which calls for developing 10 new antibiotics by 2020. Since the initiative was launched in April 2010, one new drug has been approved by the FDA. The IDSA proposes financial incentives such as tax credits, guaranteed markets to encourage investment in research and development. This raises a moral issue: Should the development of vital drugs be left exclusively to the market system?

The message on World Health Day is loud and clear. The world is on a risky path of losing the miracle drugs which have been so important to mankind. WHO has many proposals, some similar to IDSA; e.g. promoting rational use of drugs, education on drug use, infection prevention and control, drug regulation, and incentives for research and development. We cannot allow the loss and misuse of drugs, essential for curing many millions, to become the next global crisis.

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