The good, the bad and the ugly!! - Antibiotics

India is the world's antibiotic-popping capital, recording the highest annual consumption of 13 billion against 10 billion in China and 7 billion in the US. The golden age of medicine began with the discovery of antibiotics. Less than 90 years later, their overuse has given rise to deadly "superbugs." Due to the extensive and inappropriate use of antibiotics in both human and animal health sectors, the emergence of antimicrobial resistance (AMR) is on a high. The accelerated emergence of antibiotic resistance among prevalent pathogens is of global health concern. It is a growing global public health threat with serious health, political, and economic implications. It threatens the effective treatment of an ever-increasing range of infections caused by microbes as well as the achievements made by the modern medicine.

The reckless use, over the counter sale of drugs, self-medication and an ease of access have rendered the deadly strains of life-threatening bacteria resistant to even the latest generation of antibiotics rampant in India. The rampant rise in antibiotic use poses a major threat to public health, especially when there's no oversight on appropriate prescribing.

The extravagated and overzealous consumption can be attributed to the fact that everyone feels awful when they are sick and just wants to feel better. For some reason, "faith in the body's natural ability to heal itself has waned, and everyone believes that an antibiotic is the only possible cure that could help."

The first state of the World's Antibiotics report 2015, to be released by Washington-based Centre for Disease Dynamics, Economics and Policy, documented that bacterial strain Klebsiella pneumonia's resistance to the last-resort antibiotic class, carbapenems, was a whopping 57% in India in 2014, the previous stats being 29%. The bug is around 80% resistant to class III generation cephalosporins, 73% to fluoroquinolones and 63% to aminoglycosides. For four of five drug classes tested, *Klebsiella* was over 60% resistant in India. Carbapenem antibiotics are for use in the direst of the dire circumstances - when someone's life is in danger, and no other drug could come to cure.

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With antibiotic use increasing by 43% in India from 2000 to 2010, resistance to the deadly *Escherichia coli*, which causes somber food poisoning, abdominal cramps, and severe diarrhea, too has been growing. For three different drug classes, *E. coli* resistance in India is currently over 80%. If these trends continue, infections that could be treated in one or two weeks may become routinely life-threatening.

A study published in The Lancet Infectious Diseases journal showed that the "superbug," New Delhi metallo-beta-lactamase 1, which makes bacteria resistant to almost all antibiotics, including the most powerful class called carbapenems, was present in Delhi's water supply.

A recent study in the Journal of the American Medical Association shows that despite clear evidence antibiotics should never be prescribed for acute bronchitis – a wheezing, deep cough – about 70% of bronchitis patients from 1996 to 2010 received prescriptions. Still, every year, doctors write an estimated 100 million antibiotic prescriptions for conditions they cannot treat. In part, that is, because a number of people in the world incorrectly believe antibiotics are an effective treatment for infections. *Plasmodium falciparum*, the most dangerous of the malaria parasites, has developed resistance in nearly all areas of the multiple-drug-resistant (MDR), tuberculosis (TB), and extensively drug-resistant TB is on the rise. Almost 50% of MDR-TB cases worldwide are estimated to occur in China and India.

While, in US and EU, around 50,000 people died from antibiotic resistance in 2013, for India, the numbers are

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frightening. Over 58,000 children died in India in 2013 while the AMR review pegged total deaths in India from this menace at two million by 2050 if nothing is done.

Each year drug-resistant "superbugs" have sickened about millions of people and killed thousands. That's why organizations like the US Centres for Disease Control and Prevention have publicly and vocally urged that prescribing practices need to change.

However, owing to the hand-outs and efforts of public health campaigns, consumers are slowly becoming aware that the overuse of antibiotics has given rise to bacteria that have mutated defenses stronger than the toughest of these drugs. In the last two decades, as drug-resistant bacteria have spread in hospitals and the broader community, educating physicians and patients about the long-term effects of antibiotic use is slowly changing old practices.

The World Health Organization (WHO) has a very pessimistic outlook for the globe unless something is done about the over- and misuse of antibiotics. Antibiotic resistance is placing the world at risk of returning to the grim days of the preantibiotic era, when so many children and older people died of infectious diseases, and major surgery was virtually impossible because of the risk of infection. We need to preserve the power of our antibiotics and 'save the pill for the really ill.'

Antibiotic resistance is a stark reality across the globe, including in India. The challenges associated with controlling antibiotic resistance, particularly in India, are many and multifaceted. Molecular-based detection of the drug resistance of indicator microorganisms is a challenge, as is monitoring their circulation in hospitals and in the community. An approach that integrates surveillance for drug-resistant organisms in animals and humans is the current need.

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