**Preventing a pandemic**

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The WHO has declared Antimicrobial Resistance (AMR) one of the top 10 global public health threats to humanity and termed it “the biggest threats of the 21st century to global health”.

Antimicrobials – including antibiotics, antivirals, antifungals and anti-parasitic – are medicines used to prevent and treat infections in humans, animals and plants.

Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites change over time (due to faulty use, overuse of antibiotics or mutation) and no longer respond to medicines. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or impossible to treat. This results in an increased risk of disease spread, severe illness, higher medical cost, longer hospital stays and even death. The world faced this when TB, Malaria and HIV/AIDS medication turned resistant to traditional anti microbes’ regimes.

According to the US Centres for Disease Control and Prevention, more than 2.8 million antibiotic-resistant infections occur in the United States each year, with more than 35,000 people dying as a result.

AMR has caused more deaths than the annual death toll from malaria or HIV/Aids. This imploding human catastrophe is further revealed by a January 19, 2022 research article in ‘The Lancet’. The study was undertaken in 204 countries, where 471 million individual records or isolates and 7585 study-location-years were reviewed. This study revealed that an estimated 4·95 million deaths were associated with bacterial AMR in 2019.

Resistance was found the highest in the poor western sub-Saharan Africa, South Asia (LMIC countries), at 27·3 deaths per 100 000, and lowest in high-income countries, at 13 per 100,000. Lower respiratory infections followed by bloodstream infections, and intra-abdominal infections accounted for around 80 percent of deaths. The researchers inform that young children are at higher risk, with about one in five deaths linked to AMR among children under five. Reliable data for Pakistan couldn’t be obtained due to a poorly functioning AMR surveillance system.

Some of the key reasons for AMR are irrational use of antibiotics, poor medical ethics, a void in AMR legislation, regulation, poor infection prevention, poor water and sanitation facilities, low health awareness and over the counter sale of antibiotics at pharmacies.

Step one of the strategy to manage this crisis is moving from human-specific to a ‘one health approach’, bringing together multiple stakeholders engaged in human, terrestrial, aquatic animal and plant health, the food industry and environmentalists to work together for better health outcomes. The one health task force can be optimally functionalised and empowered to steer this ahead, virtually linked to international forums on ‘one health’ and AMR.

Second, over-prescription of antibiotics for temporary gains is deeply ingrained in the healthcare industry. Equally, over-the-counter availability of antibiotics and a culture of convenient self-medication have also endangered lives. Robust legislation to boost professional values, ethics and standards in medical practice and rational use of antibiotics is the only way to put a stop to this.

Third, while there are regulatory platforms like the PMC, enforcement of regulations has been lax. The proposed legislation may provide an impetus, empowering it with the capacity to levy tough sanctions.

The system needs to be up for changed management and leadership, especially DRAP which may need a complete reboot. Regulation of pharmacies, private outlets, hospitals, clinics and quackery would be a big step in the right direction.

Fourth, poor awareness of antibiotics usage even in educated households is an unfortunate reality. This requires a ‘fit for purpose’ drug awareness campaign engaging all of the media. Planning AMR awareness weeks could be a good start.

The rational and effective use of drugs education must be made integral to an undergraduate’s medical education. This can also be incorporated into other health education curricula and public health campaigns.

The role of civil society, religious scholars, opinion moulders, and academia is pivotal to support this campaign. Fifth, there should be both hospital-based and community-based infection prevention and control programmes focused on water, sanitation, and hygiene for AMR management. A sustained, targeted and risk-steered comprehensive programmatic approach would help.

Six, the drug industry pumps bulk of microbes, anti-microbes ingredients in the waste that either enters the water/sanitation system or onto agricultural land. This can pollute fruits, vegetables, water and submarine life with toxic material. Increased use of antibiotics in farming has also been identified as a potential contributor to AMR in humans.

This calls for an oversight and regulation mechanism to ensure that the quantity of anti-microbes is not ingested inadvertently into human bodies. Seven, we don’t have a viable consumer society’s network that has the legitimacy and power to create peer pressure. Organised, legitimate and empowered bodies should be created and supported to work as watchdogs for this cause.

Eight, vaccination is one of the most cost-effective interventions and has saved millions of lives – 2-3 million lives each year. Preventing infections through vaccinations would reduce the need for antibiotics. The pneumonia vaccine is one turning event, new vaccine programmes are underway for S aureus, E Coli, etc and hopes are pinned on further innovations.

Ninth, efforts to build laboratory infrastructure is paramount to addressing the universal burden of AMR, by improving the management of patients and the quality of data in AMR surveillance. Through microbiological testing, labs can inform doctors to stop or narrow antibiotic prescriptions.

In this, lab networks need to be expanded and capacitated to ensure complete AMR surveillance which should be extended to all public and private health facilities. Private-sector labs should be mandated to share data with the national AMR cell.

And, finally, innovation in developing new drugs and vaccines is a timely investment and should be provided due space in national policymaking. Developing linkages between private and public-sector institutes for pooling knowledge and technology would pay off.

The whole AMR action plan needs a sustained, predictable and accountable financial mechanism for tangible health outcomes. Investing more in preventing a pandemic rather than responding to one has higher human, economic and national security dividends. The clock has started ticking.

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