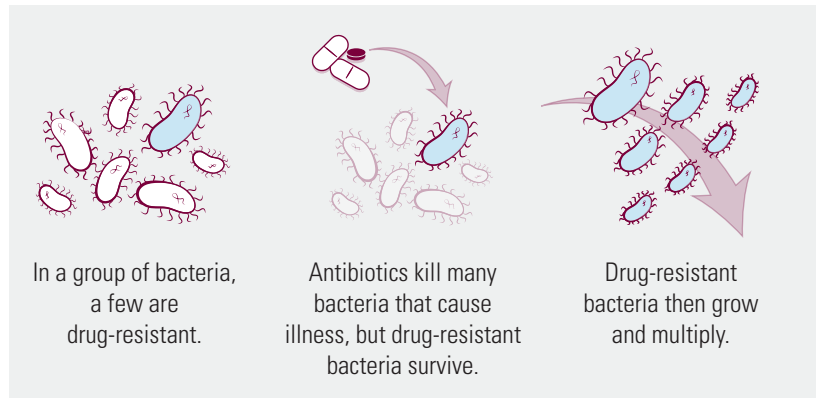


# Drug Resistant Infections & Antimicrobial Resistance

## A Pressing Threat to Modern Medicine

### What is Antibiotic Resistance?

- Antibiotics are drugs used in medicine and agriculture that arrest the growth of bacteria.
- Antimicrobial Resistance (AMR) can occur when these microbes evolve insensitivity to the drugs. This can occur through mutations in genes in microbial chromosomes or by acquiring genes from other microbes that already are resistant.
- Note that it is the microbes that become resistant, not the human or animal hosts.



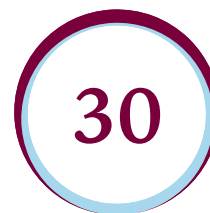
Resistant bacteria can travel across the globe on humans, animals, or other goods.

### What is the scope of AMR?

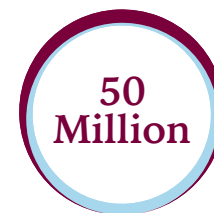
- AMR is a challenge with all infectious microbes (bacteria, fungi, parasites, and viruses), but the problem is especially acute with disease causing bacteria. Because many bacteria that cause disease in humans also reside in animals, antibiotic use and resistance in agriculture can impact human health.
- AMR is on the rise in all disease causing bacteria and in some cases bacteria are resistant to all available drugs. Over 700,000 die every year from drug resistant infections.
- Resistant bacteria can travel across the globe on humans, animals or other goods. Antibiotic use and the prevalence of resistance in distant countries therefore can directly impact Canadians.
- There are no antibiotics that are invulnerable to resistance. As a result we will always need new drugs or alternatives such as vaccines to control infection.

### What's at stake?

- Antibiotics not only cure life-threatening diseases such as pneumonia and blood poisoning, they are powerful medicines that enable physicians to perform high risk procedures such as surgeries, hip and knee replacements, cancer chemotherapy that weakens the immune system, and care of our most vulnerable populations such as the elderly and pre-term infants.
- No new classes of antibiotic drugs have been discovered in over 30 years and the pharmaceutical industry has pulled back investment in antibiotic discovery. This is why we are now considering alternative approaches and novel solutions.
- It is estimated that if we do not find any new antibiotics or alternatives, by 2050 as many as 50 million people will die, who otherwise could be treated safely. The cumulative cost to the global economy is estimated to be \$100 trillion USD.



The number of years that have passed without any new classes of antibiotic drugs being discovered.



The number of people that are estimated to die by year 2050 if we do not find any new antibiotics.



The cumulative cost to the global economy if no new antibiotics are discovered.