

When Antibiotics Fail

The growing cost of antimicrobial resistance in Canada



Council of
Canadian
Academies

Conseil des
académies
canadiennes

We depend on the widespread availability of effective antimicrobials to prevent and treat infections in humans, animals, and crops. But bacteria continually evolve to resist antimicrobials, leading to ineffective drugs, and serious infections, that are increasingly difficult to treat. Antimicrobial resistance (AMR) is on the rise worldwide and new data suggest that the potential impact of AMR poses a serious threat to the health and wealth of Canada.

When Antibiotics Fail is an independent, evidence-based assessment of the potential socio-economic impact of AMR in Canada. Using existing data and a quantitative economic model, a panel of experts found that in Canada:



In **2018**, approximately **26%** of infections were resistant to the drugs generally used to treat them.



By **2050**, the rate of resistance is likely to grow to **40%**.

AMR affects health

2018 (26% resistance)

5,400 lives lost per year in Canada as a direct result of AMR.

2050 (40% resistance)

13,700 lives lost each year as a direct result of AMR.



Most common infections:

- Skin and soft tissue infections
- Urinary tract infections
- Intra-abdominal infections
- Pneumonia

Most resistant infections:

- Musculoskeletal infections
- Skin and soft tissue infections
- Urinary tract infections
- Pneumonia/Intra-abdominal infections

AMR affects the health system

2018 (26% resistance)

AMR costs the Canadian healthcare system approximately

\$1.4 billion a year.

2050 (40% resistance)

AMR costs the Canadian healthcare system approximately

\$7.6 billion a year.



AMR could increase the risk and reduce the availability of routine medical procedures including:



Kidney dialysis



Joint replacement



Chemotherapy



Caesarian section

AMR affects the economy

2018 (26% resistance)
AMR reduces the Canadian GDP by **\$2 billion** annually.



2050 (40% resistance)
AMR reduces the Canadian GDP by **\$21 billion** annually.



The top five industries affected by AMR are:

- Recreation and culture
- Public service
- Transportation
- Animal Product Manufacturing
- Manufacturing/Construction/Retail

If AMR increases gradually from 26% to 40%, by 2050, the **cumulative** cost to Canada is estimated at:



396,000 lives



\$120 billion in hospital costs



\$388 billion in GDP

AMR affects how we live, work, and connect

The social impacts of AMR may outweigh the economic costs, and they will be unequally distributed among Canadians.



The way forward

Identify emerging trends and opportunities by continuously monitoring AMR and antimicrobial use

Open the doors to new treatments by pursuing new therapeutic targets and approaches



Preserve the future effectiveness of antimicrobials by using them carefully and appropriately across sectors

Reduce the number of infections with strict adherence to best practices including hand hygiene, equipment cleaning and other practice standards