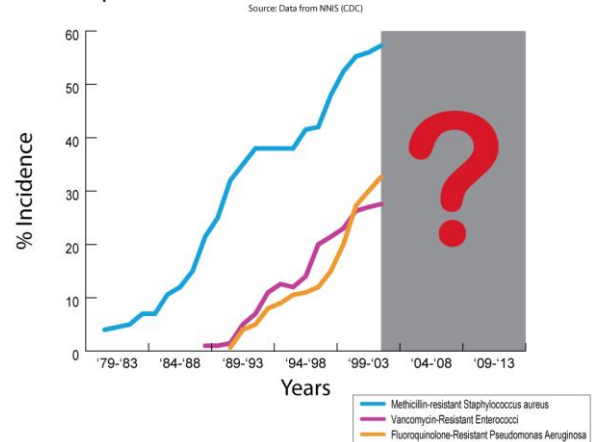


Antibiotic Resistance

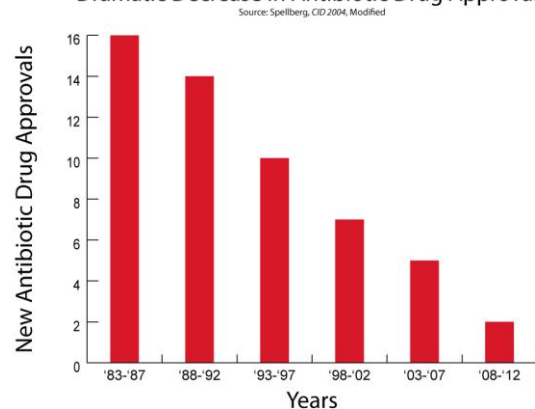
The discovery of antibiotics in the 1930s fundamentally transformed the way physicians care for patients, shifting their approach from a focus on diagnoses without means to intervene into a treatment-focused approach that saves lives. Now, nearly 70 years later, we've reached a critical point in treating infectious diseases: new drugs are not being developed at anywhere near the pace necessary to keep ahead of the natural ability of bacteria to evolve and defend themselves against antibiotics. The result is that some of our most powerful drugs are becoming useless.

- Antimicrobial resistance is recognized as one of the greatest threats to human health worldwide.
- Drug-resistant infections take a staggering toll in the United States and across the globe. Just one organism, methicillin-resistant *Staphylococcus aureus* (MRSA), kills more Americans every year than emphysema, HIV/AIDS, Parkinson's disease, and homicide combined.
- Nearly 2 million Americans per year develop hospital-acquired infections (HAIs), resulting in 99,000 deaths – the vast majority of which are due to antibacterial-resistant pathogens.
- Two common HAIs alone (sepsis and pneumonia) killed nearly 50,000 Americans and cost the U.S. health care system more than \$8 billion in 2006.
- Based on studies of the costs of infections caused by antibiotic-resistant pathogens versus antibiotic-susceptible pathogens, the cost to the U.S. health care system of antibiotic resistant infections is \$21 billion to \$34 billion each year and more than 8 million additional hospital days.
- Antibiotics are becoming less and less effective, in part due to over-prescription and inappropriate use.
- New antibiotic development has slowed to a standstill due to market failure and regulatory disincentives. Antibiotics aren't as profitable as other drugs (e.g., drugs to treat diabetes or asthma, which patients take for years). Also, the US Food and Drug Administration has long delayed publishing workable guidances describing how companies should design antibiotic clinical trials. Moreover, once a new antibiotic makes it to market, physicians hold it in reserve for only the worst cases rather than rushing to use it on all their patients due to fear of drug resistance. These economic and regulatory disincentives have made it far too difficult for companies to continue developing new antibiotics.

Rapid Increase in Antibacterial Resistant Strains



Dramatic Decrease in Antibiotic Drug Approvals



If we do not act immediately we face a future that may resemble the days before these “miracle” drugs were developed; one in which people die of common infections, and where many medical interventions we take for granted – including surgery, chemotherapy, organ transplantation and care for premature infants – become impossible.