

Antibiotic Resistance Awareness

Antibiotic Consumption

Global Consumption of Antibiotics in human medicine has risen between 2000 and 2010⁽¹⁾ **36%**

235 Million doses consumed annually in the U.S.A.⁽²⁾

Rx

Overprescription of Antibiotics for Respiratory Symptoms

Out of **40 Million** people who are given antibiotics for respiratory issues, annually in the U.S.:

Over 27 Million People get antibiotics unnecessarily⁽²⁾

Only 13 Million People who need antibiotics actually get them⁽²⁾

Up to **1/2** of all antibiotics prescribed in human medicine are not needed or not prescribed appropriately.⁽³⁾

In developed countries, between **10 & 20 courses of antibiotics** are prescribed to children before they are **18 years old!**⁽⁴⁾

AMR Worldwide

14,000 Patients Die of *C. difficile* infection annually in the USA.⁽⁵⁾ The use of antibiotics was a major contributing factor in up to 85% of cases.⁽⁵⁾

2,000,000 Infections per year contain bacteria that are resistant to one or more antibiotics in the USA.⁽⁵⁾

25,000 Patients Die Each Year as a result of antibiotic-resistant infections in Europe.⁽⁶⁾

480,000 People Infected by drug-resistant TB strains in 2013 Worldwide.⁽⁷⁾

23,000 Patients Die Each Year as a result of antibiotic-resistant infections in the USA.⁽⁵⁾

11,000 Estimated Deaths caused by methicillin-resistant *Staphylococcus aureus* (MRSA) each year in the USA.⁽⁸⁾

400,000 Infections per year with the 6 most frequent multi-drug resistant (MDR) bacteria, in 4 types of infection, in Europe.⁽⁹⁾

1 Child Dies Every 9 Minutes from an infection caused by antibiotic-resistant bacteria in India.⁽¹⁰⁾

Antibiotic Resistance Timeline

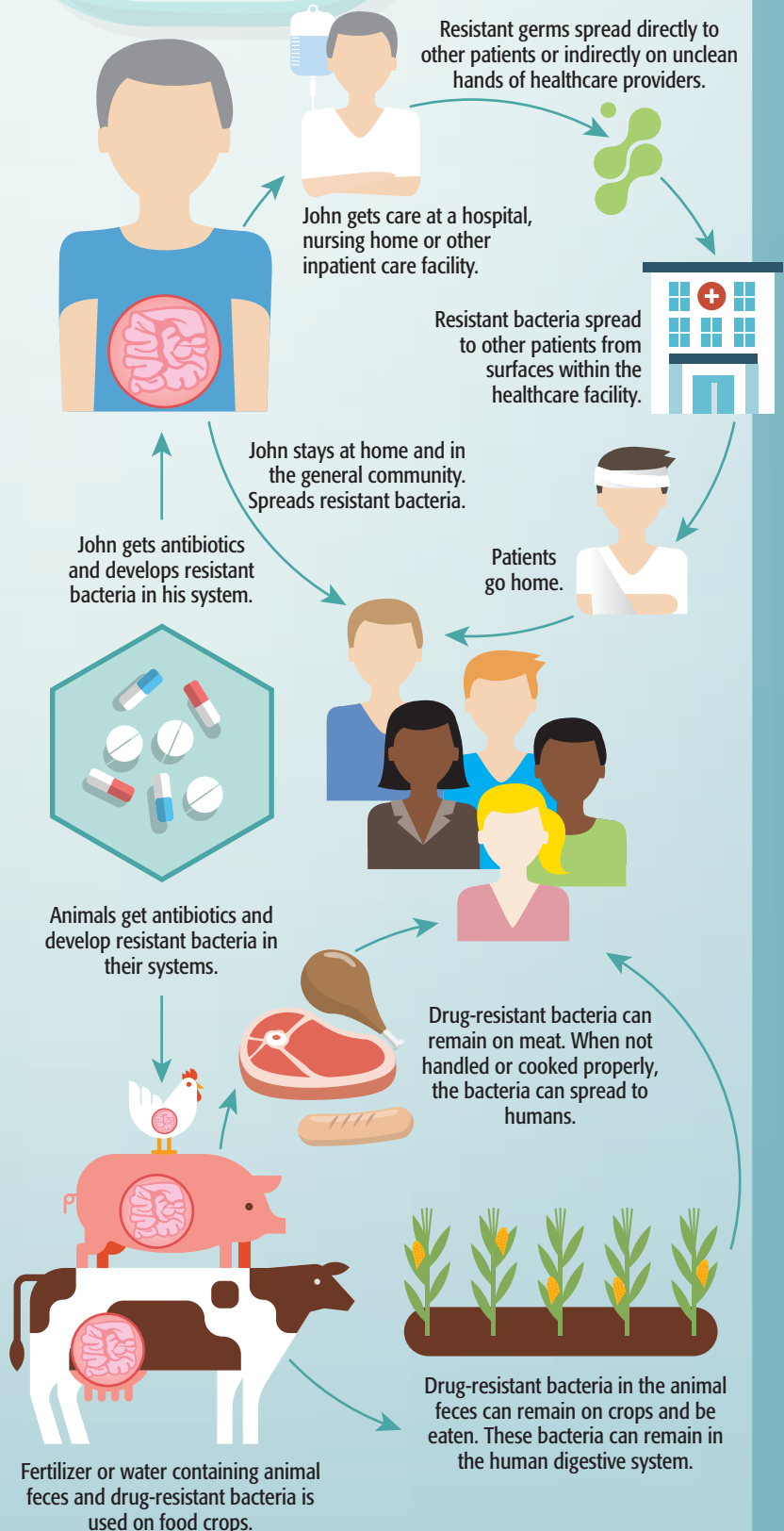
Developing Resistance

Timeline of Key Antibiotic Resistance Events

Dates are based upon early reports of resistance in the literature. In the case of pan drug-resistant (PDR) - *Acinetobacter* and *Pseudomonas*, the date is based upon reports of health care transmission or outbreaks. Note: *penicillin* was in limited use prior to widespread population usage in 1943.⁽³⁾

Antibiotic Introduced	Antibiotic Resistance Identified
penicillin 1943	1940 penicillin-R <i>Staphylococcus</i>
tetracycline 1950	
erythromycin 1953	
methicillin 1960	1959 tetracycline-R <i>Shigella</i>
	1962 methicillin-R <i>Staphylococcus</i>
	1965 penicillin-R <i>Pneumococcus</i>
gentamicin 1967	1968 erythromycin-R <i>Staphylococcus</i>
vancomycin 1972	1979 gentamicin-R <i>Enterococcus</i>
	1987 ceftazidime-R <i>Enterobacteriaceae</i>
	1988 vancomycin-R <i>Enterococcus</i>
levofloxacin 1996	1996 levofloxacin-R <i>Pneumococcus</i>
	1998 imipenem-R <i>Enterobacteriaceae</i>
linezolid 2000	2000 XDR tuberculosis
	2001 linezolid-R <i>Staphylococcus</i>
	2002 vancomycin-R <i>Staphylococcus</i>
daptomycin 2003	2004/05 PDR- <i>Acinetobacter</i> and <i>Pseudomonas</i>
	2009 ceftriaxone-R <i>Neisseria gonorrhoeae</i>
ceftaroline 2010	2011 ceftaroline-R <i>Staphylococcus</i>

How Antibiotic Resistance Spreads⁽³⁾



MY ROLE MATTERS
IN FIGHTING ANTIMICROBIAL RESISTANCE

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(1) CDDEP website: http://cddep.org/publications/state_worlds_antibiotics_2015
 (2) Review on Antimicrobial Resistance, Rapid diagnostics: Stopping Unnecessary Use Of Antibiotics. 2015
 (3) Antibiotic Resistance Threats in the United States, 2013. Centers for Disease Control and Prevention (CDC)
 (4) Blaser M. Antibiotic overuse: Stop the killing of beneficial bacteria. *Nature* 2011;476:393-394.
 (5) Chang HT et al. *Infect Control Hosp Epidemiol*, 2007; 28:926-931

(6) ENI 2013-04-10 European Report on patient safety
 (7) Global Tuberculosis Report. World Health Organization, 2014
 (8) WHO Antimicrobial Resistance Fact sheet N°194. Updated April 2015.
 (9) Antibiotic Resistance: Implications for Global Health and Novel Intervention Strategies. Washington, DC. The National Academies Press. 2010 (Source ECDC/ EMEA 2009)
 (10) Laxminarayan et al. Antibiotic resistance - the need for global solutions. *Lancet Infect Dis* 2013;13:1057-98