

The Problem of Antibiotic Resistance

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WHO warns against 'post-antibiotic' era

Agency recommends global system to monitor spread of resistant microbes.

Sara Reardon

30 April 2014

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Nobel Prizes 2015



Anti-parasite drugs sweep Nobel Prize in medicine 2015

Chinese pharmacologist Youyou Tu developed key anti-malarial drug artemisinin.

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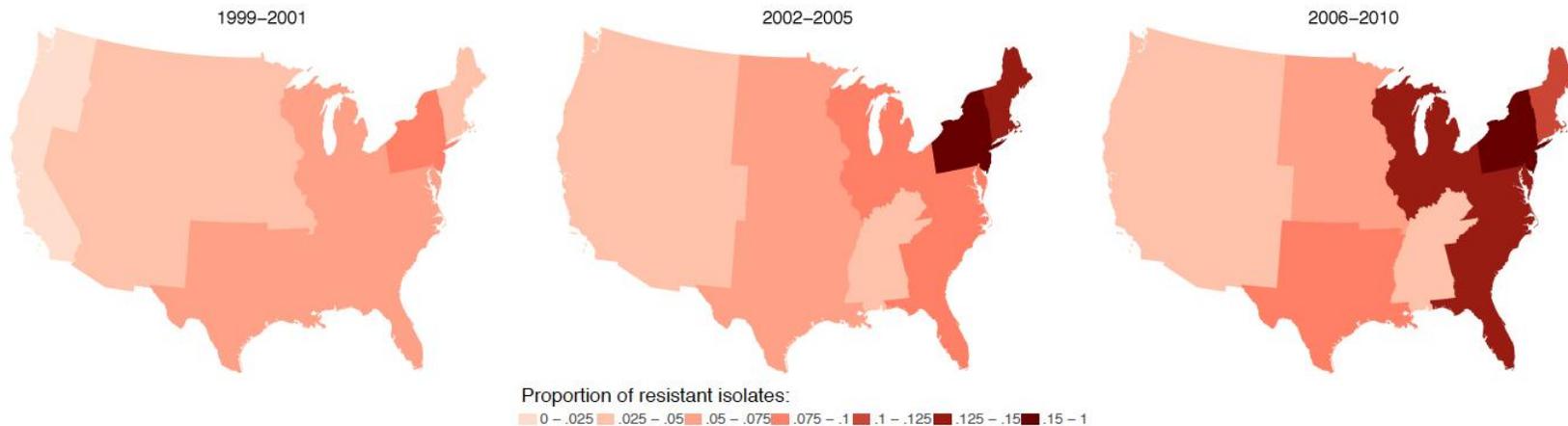


Carbapenem and 3rd. gen. cephalosporin resistance among *K. pneumoniae* highest along the East Coast, but present in all regions of the country

Carbapenem



3rd Gen. Cephalosporins

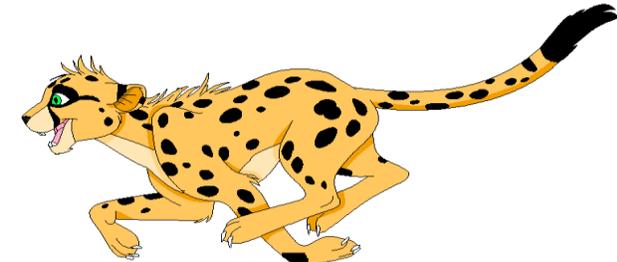


Note: Data for 2010 available through July.

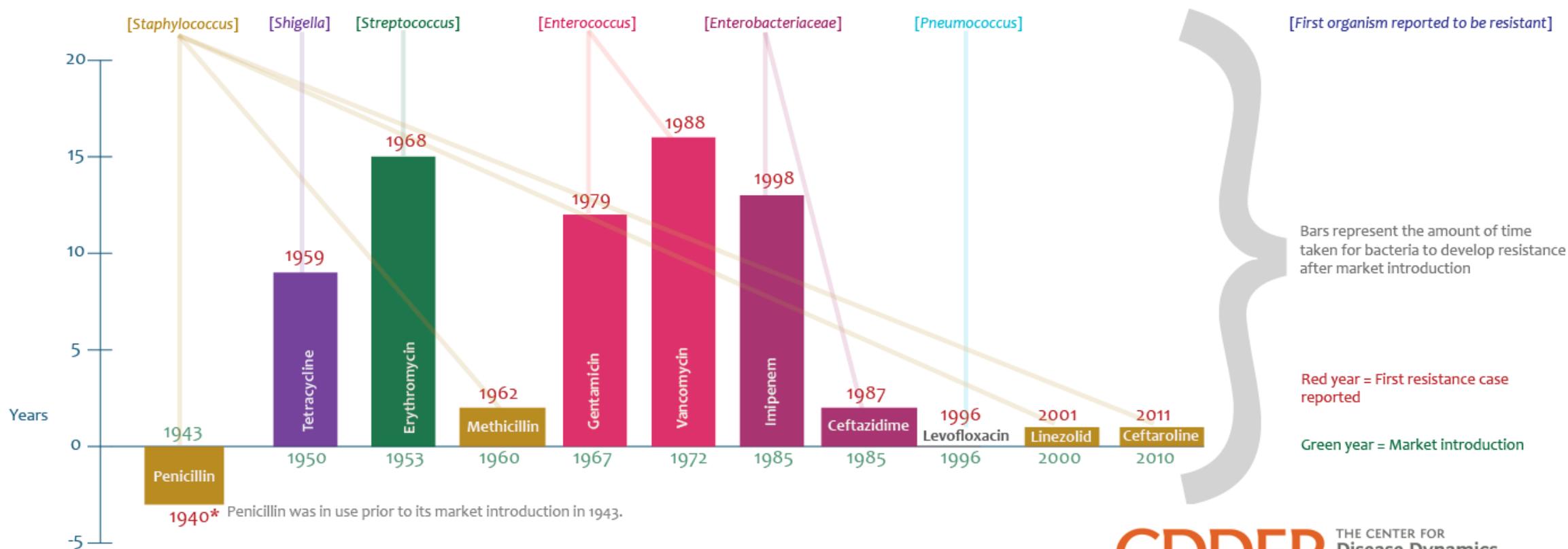
Data source: Braykov NB, Eber MR, Klein EY, Morgan DJ, Laxminarayan R. Trends in Resistance to Carbapenems and Third- Generation Cephalosporins among Clinical Isolates of *Klebsiella pneumoniae* in the United States, 1999-2010. *Infect Control and Hospital Epidemiology*. 2013; 34(3)



Antibiotic resistance is a coevolution problem.



First reported cases of bacterial resistance against key antibiotics



Data source: Antibiotic Resistance Threats in the United States, 2013.
US Centers for Disease Control and Prevention (CDC).



So...what do we do about it?

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So...what do we do about it?



DRIVE-AB

Developing new economic models to incentivise antibiotic discovery and development activities while safeguarding the efficacy of antibiotics by researching and advocating their appropriate use.

October 2014 – September 2017

Antibiotics are complicated.

- Patents do not provide industry an incentive for stewardship.
- Antibiotics are different from other drugs.
 - They benefit (and harm) more than the person treated
 - Most antibiotics treat a variety of infections
- Antibiotics have value beyond direct treatment.
 - Indirect treatment (e.g., prophylaxis for surgeries or chemotherapy)
 - Diversity (having a lot of drugs in the arsenal)
 - Option (having a drug on the shelf in case of a major outbreak)

Thank you!