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Increasing antimicrobial resistance: Clinical and other outcomes in community infections

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Antimicrobial resistance (AMR) is one of the greatest clinical challenges in modern medicine. It has been precited that by 2050 mortality due to AMR will exceed 10 million with excess costs of $100 trillion (O'Neil report 2016). The majority of infections are treated empirically in the community setting. In the US, the most frequent of bacterial infections are skin and respiratory and urinary tract infections. The most common bacterial causes of these infections are *Staphylococcus aureus* (methicillin susceptible and methicillin resistant) and Gram-negative species, *Streptococcus pneumoniae* and *Escherichia coli* respectively. Each of the species has significant resistance challenges often leading to adverse outcomes, both clinical and economic. Current empiric antibiotics are frequently inadequate to cover the predominant pathogens or have a challenging adverse event profile. Empiric therapy for skin infections should encompass MRSA (40-50% of staph isolates) and in certain patients Gram negative pathogens (which occur in almost 40% of infections), macrolide resistant pneumococcus (40%) and trimethoprim/sulphamethoxazole (>30%) and fluoroquinolone *Escherichia coli* (10-15%) in urinary tract infections. Failure of initial empiric therapy is assessed by one of four outcomes, a need for extra initial antibiotics, a second course of different class, need to visit the urgent care clinic or the emergency department (with or without admission). In addition to clinical failure these outcomes have a clear economic impact.

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