The Role of Vaccines in Antimicrobial Resistance Strategies

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Global Impact of AMR by 2050

300 million people are expected to die prematurely because of drug resistance

GDP will shrink by 2 to 3.5%

Global economy will lose between 60 and 100 trillion USD worth of economic output

http://amr-review.org/
WHO Global Action Plan on Antimicrobial Resistance

• Improve awareness and understanding of antimicrobial resistance
• Strengthen knowledge through surveillance and research
• Reduce the incidence of infection
• Optimize the use of antimicrobial agents
• Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions

http://www.who.int/drugresistance/global_action_plan/en/
Goals of the US National Action Plan for Combating Antibiotic-Resistant Bacteria

1. Slow the Development of Resistant Bacteria and Prevent the Spread of Resistant Infections
2. Strengthen National One-Health Surveillance Efforts to Combat Resistance
3. Advance Development and Use of Rapid and Innovative Diagnostic Tests for Identification and Characterization of Resistant Bacteria
4. Accelerate Basic and Applied Research and Development for New Antibiotics, Other Therapeutics, and Vaccines
5. Improve International Collaboration and Capacities for Antibiotic Resistance Prevention, Surveillance, Control, and Antibiotic Research and Development
A Call for Greater Consideration for the Role of Vaccines in National Strategies to Combat Antibiotic-Resistant Bacteria: Recommendations from the National Vaccine Advisory Committee

Approved by the National Vaccine Advisory Committee on June 10, 2015

National Vaccine Advisory Committee

The emergence of a novel virus receives widespread attention in the news media and among the public. However, the greatest threat to public health in the United States is unlikely to be an exotic disease but rather a familiarity with antibiotic-resistant bacteria. To combat this threat, the National Vaccine Advisory Committee (NVAC) has identified several key recommendations:

1. Implement and improve prevention and stewardship of antibiotic use;
2. Increase surveillance of emerging antibiotic resistance in humans, animals, and the environment;
3. Improve capabilities for detection and diagnostics;
4. Accelerate development of new products, including new classes of antibiotics, therapeutics, and vacc...
NVAC: Role of Vaccines in Combating Antibiotic-Resistant Bacteria

• Vaccines as part of antibiotic stewardship
  – Prevent bacterial infections and avoid need for antibiotics
  – Prevent use of antibiotics for viral infections
• Reduce transmission of antibiotic-resistant strains
• Develop new vaccines to target resistant pathogens
• Assess regulatory pathways and clinical trial designs to facilitate vaccine development
• Understand vaccine markets and incentives to support R&D for new vaccines
Vaccines prevent infections and so reduce the need to use antibiotics

This is true for vaccines that prevent bacterial infections, and it is also true for vaccines that prevent viral infections, such as the flu, which should not be treated with antibiotics but often are anyway. This may be for lack of rapid diagnostic tests to inform prescription or because patients buy them over the counter.

Vaccines also have the potential to reduce the use of antibiotics in agriculture
Recommendations

- Use existing products more widely in humans and animals
- Renew impetus for early research
- Sustain a viable market for needed products
### Expanding the Value of Vaccines

#### Over 7 million

Since its launch in 2000, Gavi has helped developing countries to prevent more than 7 million future deaths from hepatitis B, Haemophilus influenzae type b, human papillomavirus, Japanese encephalitis, measles, meningitis A, pneumococcal disease, rotavirus diarrhoea and yellow fever.

#### Over half a billion

Number of children Gavi has reached with lifesaving vaccines in the 15 years since the organisation was founded.

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Number of antibiotic courses **not given** because of illnesses prevented by vaccination.