Hundreds of partner organizations worldwide with **ONE** message:
You can’t manage costs without managing NCDs
COVID-19’s Revealing Linkage with Chronic Disease

CHRONIC DISEASE AND COVID-19: Who’s at Risk and How to Prepare

Older adults and people living with chronic conditions are at higher risk of serious illness from COVID-19. In addition to following all the CDC and WHO recommended precautions, it is important that people with the following underlying health conditions and their loved ones understand how to help minimize risks.

HEART DISEASE (congestive heart disease, coronary artery disease)

CHRONIC KIDNEY DISEASE (including receiving dialysis)

HIGH BLOOD PRESSURE

BLOOD DISORDERS (stroke, diabetes, hepatitis, chronic liver disease)

CHRONIC LIVER DISEASE

COMPROMISED IMMUNE SYSTEM (medications that suppress the immune system, such as corticosteroids or other immunosuppressant medications, HIV or AIDS, organ or bone marrow transplant recipient)

LUNG DISEASES (asthma, COPD, cystic fibrosis, emphysema or other conditions associated with impaired lung function or requiring home oxygen)

DIABETES OR OTHER ENDOCRINE DISORDERS

DISORDERS OF THE BRAIN, SPINAL CORD, PERIPHERAL NERVE, AND MUSCLE (cerebral palsy, aphasia, stroke, intellectual disability, muscular atrophy, or spinal cord injury)

REFERENCES:

COVID-19 Laboratory-Confirmed Hospitalizations: Preliminary data as of June 13, 2020

Selected Underlying Medical Conditions

- Asthma
- Autoimmune disease
- Cardiac disease
- Chronic lung disease
- DIabetes or Other Endocrine Disorders
- Disorders of the Brain, Spinal Cord, Peripheral Nerve, and Muscle
- Gastrointestinal/Hepatic Disease
- Hypertension
- Immune suppression
- Metabolic disease
- Neurological disease
- Obesity
- Pregnancy
- Renal disease
- Other disease
- No known condition

Percentage
Understanding the Links Between Chronic Disease and AMR

Economic Analyses on Costs

**Antibiotic-Resistant Infection Treatment Costs Have Doubled Since 2002, Now Exceeding $2 Billion Annually**

- People living with chronic diseases most at risk and have the most to gain from progress/lose from continued erosion
- Threatens care people rely upon – Joint replacement for osteoarthritis, cancer treatments, dialysis, organ transplants
- Our ability to prevent and cure infections is foundational to modern medicine
Advocating for policy changes that would help activate and support research and development of new treatments and therapies for infectious diseases.

Motivating broad change in the way antibiotics are developed, distributed and consumed.

Reinforcing awareness about the importance of antibiotics, the challenges of antimicrobial resistance to modern medicine and AMR’s threat to health.
Today’s Speakers

Amanda Jezek

**POSITION**
Senior Vice President, Public Policy and Government Relations

**COMPANY**
Infectious Diseases Society of America

**LOCATION**
Arlington Virginia UNITED STATES

KEVIN OUTTERTON, ESQ.
Executive Director

Kevin Outterson is a global thought leader on business models for antibiotic development and use. He is Professor of Law and N. Neil Pike Scholar of Health and Disability Law at Boston University School of Law, where he leads multi-disciplinary teams to solve global health issues. Professor Outterson is the Executive Director and Principal Investigator of CARB-X and a partner in DRIVE-AB.
Getting the Public’s Perspective

Celinda Lake
LRP
LAKERESEARCHPARTNERS

Ed Goaes
THE TARRANCE GROUP

PARTNERSHIP TO FIGHT CHRONIC DISEASE
Without effective antibiotics for prevention and treatment of infection...

The success of major medical procedures such as organ transplantation and cancer chemotherapy could be compromised.

Diabetes management and major surgeries like cesarean sections or hip replacements are becoming increasingly high-risk procedures.

A growing number of infections—such as pneumonia, tuberculosis, gonorrhea, and salmonella—are becoming harder to treat as the antibiotics currently available become ineffective. In addition, some infections typically found in children—such as strep throat, ear and sinus infections, and whooping cough—are also becoming concerning threats.

Drug resistance is starting to complicate the fight against HIV and malaria, as well.

 Hospitals and nursing homes managing a wide spectrum of health care demands at once and in close quarters require effective infection prevention and treatment to sustain the lives in their care and protect health care professionals.

Increasing amounts of resistant germs could severely impact animal food sources, restaurants, and food service operations.

Longer durations of illness and treatment, often for patients already living with one or more chronic conditions, can mean hospital stays, increased health care costs, productivity losses, and significant economic burden on families, caregivers, and entire communities.
Join the #Fight4Health against AMR

This is not a future problem. It is happening now.

According to the CDC, more than **2.8 million** infections resistant to antibiotics occur in the U.S. each year. And more than **35,000 people die** as a result.

[www.fightinfectiousdisease.org](http://www.fightinfectiousdisease.org)

@ThePFID
AMR and Chronic Disease: Opportunities for Advocacy & Collaboration

Amanda Jezek
Senior Vice President
Public Policy & Government Relations
Infectious Diseases Society of America
IDSA: Ongoing Commitment to AMR

IDSA’s 2004 Report on AMR

2011 Combating Antimicrobial Resistance Policy Recommendations

2016 Real Patients: Impact of AMR
Doctors Heavily Overprescribed Antibiotics Early in the Pandemic

Now they are using lessons from the experience to urge action on the growing problem of drug-resistant infections before it’s too late.
COVID-19 and Secondary Infections

• In a study of 41 patients COVID-19, 10 percent had secondary infections. Of those, 31 percent were admitted to intensive care units.

• Another report on 191 patients found that 50% of patients who died had a secondary infection.
2019 study conducted by Abdul Ghafur, MD, with Apollo Hospitals in Chennai, India, et al:

“Almost two-thirds of cancer patients with a carbapenem-resistant infection are dead within four weeks, vs. a 28-day mortality rate of 38% in patients whose infections are curable.”

“We are facing a difficult scenario—to give chemotherapy and cure the cancer and get a drug-resistant infection and the patient dying of infections. We don’t know what to do. The world doesn’t know what to do in this scenario.”

“However wonderful the developments in the field of oncology, they are not going to be useful, because we know cancer patients die of infections.”
Overuse and misuse of antibiotics speeds the development of resistance.
Federal AMR Strategy

- March 2015 National Action Plan for Combating Antibiotic Resistant Bacteria (CARB)
- 5 Goals
  - Slow resistance, prevent infections
  - One health surveillance
  - Rapid diagnostics
  - New antibiotics
  - Global coordination
Antibiotic Stewardship

Coordinated strategies to optimize antibiotic use with the goal of improving patient health outcomes and minimizing unintended consequences of antibiotic misuse (drug toxicity, *Clostridiodes difficile* infection, antibiotic resistance)
Opportunities for Collaboration

S-FAR
Stakeholder Forum on Antimicrobial Resistance

Convened by:

Infectious Diseases Society of America
S-FAR Activities

• Annual “Hill Day” and congressional briefing on AMR funding
• Sign-on letters on AMR policy initiatives
• Engagement with policymakers
For additional information, contact me at ajezek@idsociety.org.
Fighting superbugs with innovation

CARB-X funds and supports antibacterial R&D

Kevin Outterson
Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X)
Disclaimer

The views herein are personal and do not necessarily reflect the views of CARB-X or any CARB-X funder.
<table>
<thead>
<tr>
<th>Funding</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USD 1.2B (2010-19)</strong></td>
<td>Phase 2 and 3 product development against 21st Century Health Threats, including drug-resistant bacteria, and CARB-X.</td>
</tr>
<tr>
<td><strong>USD 502M (2016-21)</strong></td>
<td>Hit-to-lead to Phase 1 product development of therapeutics, diagnostics, and preventatives against WHO and CDC priority drug-resistant bacteria. Non-dilutive. Global.</td>
</tr>
<tr>
<td><strong>GBP 315M (2018-21)</strong></td>
<td>Funded through Global AMR Innovation Fund (GAMRIF) and the Fleming Fund to help LMICs tackle AMR. Fleming Fund (surveillance capacity) &amp; GAMRIF (innovative R&amp;D) both have a ‘One Health’ focus.</td>
</tr>
<tr>
<td><strong>Euro 500M (2018-28)</strong></td>
<td>Support of national research programs as well as contributions to international initiatives like CARB-X, GARDP and JPIAMR.</td>
</tr>
<tr>
<td><strong>Euro 700M (2014-20)</strong></td>
<td>Basic science, novel therapeutics, diagnostics, economic models. Priority pathogens including pathogens on WHO priority list. Member states only. Small royalty.</td>
</tr>
<tr>
<td>*<em>USD 1.4B (2016-18)</em></td>
<td>Basic research, SBIRs, pre-clinical services and other R&amp;D against bacterial threats, for vaccines, therapeutics and diagnostics. Non-dilutive. Global. *Mostly antibacterial, but also includes viral, fungal, and parasite resistance.</td>
</tr>
<tr>
<td><strong>USD 165M (2018-23)</strong></td>
<td>Lead optimization to Phase I development of therapeutics &amp; diagnostics against priority drug-resistant bacteria defined by WHO and CDC. Dilutive. US and European companies.</td>
</tr>
<tr>
<td><strong>GBP 175M (2016-21)</strong></td>
<td>Drug-resistant infections program focused on policy, strengthening evidence for action, clinical trial capabilities and innovative product development including CARB-X.</td>
</tr>
</tbody>
</table>
No quick fixes for deadly infectious diseases
It takes years to develop drugs for new pathogens

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Drug</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRSA</td>
<td>vancomycin</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>linezolid</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>daptomycin</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>ceftaroline</td>
<td>50</td>
</tr>
<tr>
<td>VRE</td>
<td>linezolid</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>daptomycin</td>
<td>17</td>
</tr>
<tr>
<td>KPC-Kp</td>
<td>ceftazidime-avibactam</td>
<td>14 yrs</td>
</tr>
<tr>
<td>NG ciprofloxacin-resistant</td>
<td>No p.o. yet</td>
<td>&gt;13 yrs</td>
</tr>
<tr>
<td>NG azithromycin-resistant</td>
<td>No p.o. yet</td>
<td>&gt;8 yrs</td>
</tr>
<tr>
<td>MDR TB</td>
<td>bedaquiline</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>pretomanid</td>
<td>27</td>
</tr>
<tr>
<td>HIV</td>
<td>AZT</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>HAART</td>
<td>15</td>
</tr>
</tbody>
</table>

What is CARB-X?

A global non-profit partnership created in 2016 to support the early development of antibiotics, vaccines, diagnostics and other products to combat the most serious drug-resistant bacteria.

Investing up to US$500 million in non-dilutive funding to support antibacterial R&D in 2016-21.
CARB-X funds 42 R&D projects in 8 countries

- **33** new classes of antibiotics and non-traditional therapeutics, inc. microbiome
- **6** rapid diagnostics
- **3** vaccines
- Treatment/prevention of infection in cystic fibrosis, pneumonia, bloodstream, sepsis, urinary tract, and more

https://carb-x.org/portfolio/gallery/
CARB-X is making progress

But much more needs to be done to support and sustain innovation and deliver antibiotics that patients need to fight superbug infections.
Innovation in the CARB-X portfolio

A

Number of Applications

Peptides
Small Molecule
Other
Phage
Microbiome
Nucleic acid
Drug Conjugate

B

Number of Applications

Vaccines
Therapeutic Ab
Preventive Ab
Other

C

Number of Applications

AST
Pathogen ID
Both

D

Number of Applications

New Target
New Class
Both
Size distribution of applicants for funding 2019

- Academic/Non-Profit: 25.3%
- Large: 6.4%
- Medium: 8.0%
- Micro: 43.9%
- Small: 16.4%

Bar chart showing the number of applications for different applicant types for 2019, 2018, and 2016.
Big pharmaceutical companies are reducing their investment in antibacterial R&D

Dheman, et al, CID 2020 (pending)
Thank you!

www.carb-x.org
Partnership to Fight Infectious Disease

Findings based on a nationwide survey of 1000 likely general election voters

June 2-5, 2020

Celinda Lake
David Mermin
William Lawler

Ed Goeas
Brian Nienaber

Lake Research Partners
LakeResearch.com
202.776.9066
Methodology

• Lake Research Partners and the Tarrance Group designed and administered this survey that was conducted between June 2-5, 2020 via online panel. The survey reached 1000 likely 2020 general election voters nationwide.

• The sample was stratified by gender, age, region, race, and party identification to reflect the demographic composition of likely voters. Where there were slight differences between our survey sample and the expected voting population, data were weighted accordingly.

• In interpreting survey results, all sample surveys are subject to possible sampling error; that is, the results of a survey may differ from those which would be obtained if the entire population were interviewed. The size of the sampling error depends upon both the total number of respondents in the survey and the percentage distribution of responses to a particular question. For example, if 50% of respondents answered “Yes” to a particular question, we can be 95% confident that the true percentage will fall within 3% of this percentage, or from 47% to 53%.
## Profile of Survey Respondents

### Gender
- Male: 47%
- Female: 53%

### Age
- Under 30: 16%
- 30-39: 15%
- 40-49: 16%
- 50-64: 29%
- 65+: 24%

### Race
- White: 78%
- Black/African American: 12%
- Latinx: 10%
- AAPI: 2%
- Native American: 2%

### Education
- H.S. or less: 20%
- Post H.S.: 39%
- Non-College Grad: 60%
- College Grad/Post Grad: 40%

### Marital Status
- Married: 48%
- Unmarried with Partner: 19%
- Single: 23%
- Divorced: 11%
- Widowed: 5%

### Region
- Northeast: 18%
- Midwest: 23%
- South: 38%
- West: 21%

### Party Identification
- Democrat: 46%
- Republican: 39%
- Independent: 9%
Summary of Key Findings

• Voters are deeply concerned about the issue of antimicrobial resistance (AMR) and many are already familiar with the issue.

• Voters want developing new antibiotics to be a top or high priority and they don’t think enough the research currently being done is enough.

• COVID has not taken any urgency away from the issue; in fact it has made voters think more about being prepared for the next public health crisis.

• Voters are open to a wide range of solutions to encourage the development of new antibiotics, such as a public and private partnership, and direct investment by the government in research into new antibiotics.

• Support for developing new antibiotics is bipartisan, and voters want to hear where their representative stands on the issue.
After learning basic background information on AMR, 85% voters are very or somewhat concerned about AMR. Intensity is high as well, with nearly half of voters saying they are very concerned.
This concern translates into support for research into new antibiotics. About 3 in 4 voters support making developing new antibiotics to combat antibiotic resistance a top or high priority in public health.

How high of a priority would you put on developing new antibiotics to combat resistant bacteria?

- A high priority: 76
- Somewhat of a priority: 34
- A top priority: 20
- Not much/not a priority at all: 3
A majority of voters believe that more research needs to be done; fewer than 1 in 10 think there is too much research being done.

Is the amount of research being done on new antibiotics...
Voters support many solutions, but especially support an industry led initiative and direct government investment in new development.

**Do you support or oppose this idea to encourage development of new antibiotics?**

<table>
<thead>
<tr>
<th>1. Industry initiative with private and public sector</th>
<th>Oppose</th>
<th>Support</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>42</td>
<td>+74</td>
</tr>
<tr>
<td>2. Direct government investment</td>
<td>13</td>
<td>40</td>
<td>+65</td>
</tr>
<tr>
<td>3. Cash incentive for new antibiotics</td>
<td>22</td>
<td>29</td>
<td>+44</td>
</tr>
<tr>
<td>4. Tax incentive to encourage development</td>
<td>18</td>
<td>25</td>
<td>+48</td>
</tr>
<tr>
<td>5. Higher prescription payments for new antibiotics</td>
<td>27</td>
<td>20</td>
<td>+27</td>
</tr>
</tbody>
</table>

Net scores are calculated as the difference between Somewhat Support and Somewhat Oppose for each option.
Two-thirds of voters say that they are more likely to vote for a candidate that supports the development of new antibiotics. There is no political downside to taking this position.

Would you be more likely or less likely to vote for a political candidate who supports making the development of new antibiotics a priority?

<table>
<thead>
<tr>
<th></th>
<th>Less Likely</th>
<th>More Likely</th>
<th>No Difference</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2</td>
<td>65</td>
<td>25</td>
<td>+63</td>
</tr>
<tr>
<td>Democrat</td>
<td>2</td>
<td>35</td>
<td>17</td>
<td>+76</td>
</tr>
<tr>
<td>Republican</td>
<td>3</td>
<td>24</td>
<td>31</td>
<td>+54</td>
</tr>
<tr>
<td>Independent</td>
<td>0</td>
<td>17</td>
<td>41</td>
<td>+46</td>
</tr>
</tbody>
</table>