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IDSA
Infectious Diseases Society of America

April 7, 2015

The Honorable John Thune
Dirksen Senate Office Building 511
Washington, DC 20510

The Honorable Ben Cardin
Hart Senate Office Building 509
Washington, DC 20510

Dear Senators Thune and Cardin:

On behalf of the Infectious Diseases Society of America (IDSA), we are pleased to have this opportunity to write to you about how tax policy can help stimulate the research and development (R&D) of urgently needed new antibiotics and rapid infectious diseases (ID) diagnostics. We understand that, as the co-chairs of the new Senate Finance Committee working group on business tax issues, you will be reviewing tax policies that impact R&D. As part of that effort, we urge you to consider the unique issues facing antibiotics and rapid ID diagnostics, and how modest investments through the tax code can revitalize R&D for these urgently needed medical products that have the potential to greatly improve patient outcomes and public health and reduce the significant health care costs currently associated with suboptimal diagnosis and treatment of patients with serious or life-threatening infections.

IDSA represents over 10,000 infectious diseases physicians and scientists devoted to patient care, disease prevention, public health, education, and research in the area of infectious diseases. Our members care for patients of all ages with serious infections, including meningitis, pneumonia, tuberculosis, HIV/AIDS, antibiotic-resistant bacterial infections such as those caused by methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), and Gram-negative bacterial infections such as *Acinetobacter baumannii*, *Klebsiella pneumoniae*, carbapenem-resistant Enterobactericeae (CRE), and *Pseudomonas aeruginosa*, and emerging infections such as Middle East respiratory syndrome coronavirus (MERS-CoV) and Ebola virus disease (EVD).

Antimicrobial Resistance and the Urgent Need for New Antibiotics and Diagnostics

IDSA is increasingly concerned about the rise of antibiotic resistant infections and the lack of new antibiotics and diagnostics needed to treat patients with these infections. This public health crisis has been well documented by the Centers for Disease Control and Prevention, the World Health Organization, the President's Council of Advisors on Science and Technology (PCAST), and multiple other government entities and non-government experts, including IDSA with our 2004 Bad Bugs, No Drugs report and our 2011 Combating Antimicrobial Resistance: Policy Recommendations to Save Lives report. In 2013, CDC conservatively

estimated that over 2 million people in the U.S. are sickened every year due to antibiotic-resistant infections and approximately 23,000 die. The actual numbers are likely much greater, as current surveillance and data collection capabilities cannot capture the full burden. Antibiotic resistant infections also place a serious financial strain on our healthcare system. CDC has estimated that antibiotic resistance results in $20 billion in excess direct healthcare costs, with additional costs to society for lost productivity as high as $35 billion a year.

Antibiotic R&D: Market Failure

We are on the very real, very frightening precipice of a post-antibiotic era. A variety of factors have led to a market failure for antibiotic R&D. Unlike other types of drugs, the use of antibiotics decreases their effectiveness over time due to the development of resistance by the bacteria that infect us. And companies lack sufficient incentives to develop new antibiotics. Antibiotics are typically priced low compared to other new drugs, used for a short duration, and held in reserve to protect their utility, making them far less economically viable investments for pharmaceutical companies, that have to answer to shareholders, than other types of drugs.

When a company considers which new drugs to invest in and develop, it considers the net present value (NPV) of each new drug candidate. The NPV is calculated by subtracting the drug's R&D costs from its future potential revenues. Of great importance is that both costs and revenues are discounted in standard NPV models, using a rate of 10-11% for pharmaceutical companies and 20-40% for biotechnology companies. Thus, dollars earlier in the timeline from discovery to development have greater value than dollars later in the timeline.

Antibiotics have a much lower NPV than most other drug classes, due to their high R&D costs and modest revenues. A 2014 report commissioned by the Department of Health and Human Services (HHS) found that the NPV for a new antibiotic is always under $40 million. In fact, the NPV for a new antibiotic for two of the most difficult to treat and deadly infections, hospital associated bacterial pneumonia (HABP) and ventilator associated bacterial pneumonia (VABP), actually has a negative NPV of $-4 million, indicating that a company would likely lose money in developing and bringing to market a new drug for HABP/VABP. Companies typically want an NPV of at least $100 million to $250 million in order to undertake investment in a new drug.

In 1990, there were nearly 20 pharmaceutical companies with large antibiotic R&D programs. Today, there are only 2 or 3 large companies with strong and active programs and a few small companies with more limited programs. Unless Congress acts to stimulate the research and development of urgently needed new antibiotics, IDSA is deeply concerned that the new drugs our patients need to stay alive will not be brought to market.

In March 2015, the White House released a National Action Plan for Combating Antibiotic Resistant Bacteria, which describes plans for federal agencies to invest in research that can lead to the development of urgently needed new antibiotics and diagnostic tests. This is a welcome initiative, but government alone cannot fully address this issue. It is critical that we provide incentives for companies to bring these critical new products to market, and the White House pledged to work on such efforts in the Action Plan.

Congressional Response: First Steps

In 2012, Congress took an important step in addressing this serious problem by passing the bipartisan Generating Antibiotic Incentives Now (GAIN) Act as part of the Food and Drug Administration Safety and Innovation Act (FDASIA). This new law provides an additional five years of exclusivity for new antibiotics to treat a serious or life-threatening infection. The passage of GAIN signified Congress' commitment to addressing antibiotic resistance and the urgent need for new antibiotics. However, the GAIN Act alone is not sufficient to make antibiotics a viable investment for pharmaceutical companies.

The benefit of additional years of exclusivity can only be realized by a company long after a new drug has been developed and brought to market. Such "pull" incentives, while an important component of a multi-prong approach to stimulate antibiotic R&D, are insufficient on their own. As mentioned above, due to the risks of antibiotic development, pharmaceutical companies will "discount" the value of incentives over time by roughly 10 percent each year. Therefore, incentives that take several years for a company to realize are less impactful than "push" incentives, such as tax credits, which provide more immediate funding during the costly phases of antibiotic development. Simply stated, cash today is worth more than the promise of cash in the future.

Utilizing the Federal Tax Code

The existing research and experimentation (R&E) tax credit, while valuable in many areas of drug development, has been unable to effectively stimulate antibiotic development, as it is not sufficient to raise the net present value of antibiotic development to a point at which antibiotics can legitimately compete against other new drugs for a company's resources. IDSA instead proposes that Congress create a new tax credit for antibiotics and antifungal drugs (which face the same types of challenges as antibiotics) that treat serious or life-threatening infections. IDSA is willing to further narrow the proposed tax credit to cover only those antibiotic and antifungal drugs that treat serious or life-threatening infections for which there is an unmet medical need. Our proposal, closely modeled after the Orphan Drug tax credit that successfully incentivized drug development in similarly challenging areas, would provide a credit of 50 percent of the qualified clinical testing expenses (phase 2 and 3 clinical trials) for the taxable year.

IDSA recognizes that small companies are critical innovators in the antibiotic development space and, as such, we want to ensure that new antibiotic incentives are designed to be accessible to small companies. Our tax credit proposal would be transferable, meaning that a small company that is unable to use the credits would be allowed to sell the credits to any domestic corporation for which the primary mission is pharmaceutical research or development. This will enable small companies without tax liability to sell the credit to established, profitable companies so that the small company may then invest the sales income into additional research and development projects. Many states have employed this strategy for a variety of tax credits, including for R&D.

IDSA commissioned Ernst and Young to conduct a cost analysis of this proposal. The analysis estimated that this proposal would result in a federal revenue loss of $549 million over 10 years.

The revenue loss would be lower if the existing R&E tax credit is extended beyond its current expiration date, as is expected. Importantly, the new credit would have demonstrable impact in stimulating the development of new antibiotics and antifungals. Ernst and Young estimated that the credit would increase R&D spending on antibiotics and antifungals by over $1 billion over a 10-year period and would result in five to six new antibiotics and antifungals entering the pipeline each year. Further, new effective antibiotics will allow for more successful treatment of patients with serious or life-threatening infections, which may significantly shorten hospital stays for patients who otherwise remain sick and hospitalized for longer periods of time.

We are delighted that a member of the Ways and Means Committee in the House of Representatives, Representative Boustany (R-LA), intends to sponsor bipartisan legislation to establish an antibiotic and antifungal tax credit as well as a similar tax credit for diagnostics (described below). As a physician, Rep. Boustany has a deep appreciation of the urgent need for these new products.

Diagnostic Tests

In addition to antibiotics, IDSA's 2015 Better Tests, Better Care: The Promise of Next Generation Diagnostics report calls attention to the equally urgent need for new infectious diseases diagnostic tests that provide rapid results, are easy to use, and accurately identify the pathogen causing an infection and the best antibiotic to use. New and improved diagnostics can significantly improve patient care by giving physicians the information they need to more rapidly provide appropriate treatment. Currently, 20-30% of patients with sepsis receive inadequate initial treatment because the cause of the infection can take several days to diagnose. Better diagnostics can also improve public health by identifying patients for whom isolation or other infection control measures are needed, improving the tracking of outbreaks and emerging infectious diseases threats. Improved diagnostics can also guide the appropriate use of antimicrobial drugs, and therefore are critical to the campaign to address antibiotic resistance. Lastly, new diagnostic tests have enormous potential to reduce health care costs by facilitating faster administration of appropriate treatment, which can lead to quicker resolution of a patient's infection and a shorter hospital stay.

Thanks to advancements in scientific research, promising new diagnostic tools are within reach. For example, new diagnostics may be able to provide rapid results, screen for multiple pathogens simultaneously, and even detect non-culturable organisms. But greater investment and improved regulatory policies are needed to ensure that scientific advancements translate into the development and use of new diagnostics.

Unfortunately, there is little impetus for companies to develop rapid ID diagnostic tests, and the high cost of R&D for these products poses significant barriers. As with antibiotics, the R&E tax credit has not proven sufficient to incentivize R&D for rapid ID diagnostics.

Companies must often utilize outside laboratories to develop and validate new diagnostic tests. Many available laboratories lack the particular expertise needed to evaluate the new product (e.g., viral culture, or extraction of RNA from clinical samples). As a result, companies must provide costly training and supervision. Locating or developing a sufficient number of

laboratories with the appropriate expertise to process the large number of samples needed for a clinical trial is becoming too costly for many companies to pursue. Further, participating laboratories may need to run multiple tests in order to validate a new diagnostic. This strategy is very expensive and dramatically increases the cost of clinical trials. The cost of one effective validation method, nucleic acid sequence analysis, can add over $100,000 to the cost of a clinical trial. Such a cost increase may be prohibitive, particularly for smaller companies.

In addition to direct laboratory costs, diagnostic developers also face significant challenges accessing specimens, particularly for rare pathogens. This process can be difficult and costly, as many clinical laboratories do not have the capacity to preserve specimens containing novel or unusual organisms for further use. Even when such crucial samples are available, the cost of accessing them has become prohibitive in many cases.

Similar to our antibiotic and antifungal proposal, IDSA is also proposing that Congress establish a new tax credit to stimulate the research and development of new, rapid ID diagnostics. This proposal is also modeled after the Orphan Drug tax credit, and would provide a credit of 50 percent of the qualified clinical testing expenses for the taxable year. Clinical testing expenses must relate to an in-vitro diagnostic (IVD) device that provides results in less than four hours and that is used to identify or detect the presence, concentration, or characteristics of a serious or life-threatening infection. IDSA also recommends that this tax credit be transferable, so that small companies with no tax liability may still utilize the credit. Ernst and Young estimated that this proposal would result in a federal revenue loss of $21 million over 10 years.

Conclusion

IDSA recognizes that many policymakers share a goal of simplifying the existing tax code, not creating new credits. We also understand that federal resources are scarce, and that proposals that would result in revenue loss to the federal government must be viewed with great scrutiny. It is with these factors in mind that IDSA still underscores that the need for new federal incentives to stimulate the development of new antibiotics, antifungals and diagnostics is so great and so unique, it is worthy of Congress' attention and investment. As infectious diseases physicians, it is our job to care for patients with serious or life-threatening infections and to protect the broader public health from outbreaks. We desperately need new antibiotics, antifungals and diagnostic tests in order to effectively do that job, and without significant new investment from the federal government, companies will remain unable to bring these new products to market.

We greatly appreciate your consideration of these proposals as you undertake broader efforts to reform our nation's tax code. If you have any questions, please feel free to contact Amanda Jezek, IDSA's Vice President for Public Policy and Government Relations, at 703-740-4790 or ajezek@idsociety.org.

Sincerely,

Stephen B. Calderwood

Stephen B. Calderwood, MD, FIDSA
IDSA President