

REPORT OUT: PACCARB Working Groups

Working Group #1 Antibiotic Stewardship

Working Group #2 One Health Surveillance

Working Group #3 Diagnostic Innovations

Working Group #4 Treatment, Prevention and Control R&D

Working Group #5 International Collaboration on CARB

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Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Initial Assessment of Progress toward Goal 1: Workgroup on Antibiotic Stewardship

WG Chair: Sara Cosgrove, MD, MS

WG Vice Chair: Michael Apley, DVM, PhD, DACVP

Goal 1: Broad Recommendations

- Ensure sustained and enhanced funding
 - The institutional and behavioral changes required to promote antibiotic stewardship in humans and animals requires sustained multi-year funding directed at implementation and research activities
- Coordinate work across federal agencies including CDC, DoD, USDA, FDA and VA
 - Consider establishment of departmental and interdepartmental level leads for human (HHS) and veterinary (USDA) medicine that have the authority and responsibility for coordinating efforts and avoiding duplicative work

A One Health Approach

- Implement efforts to promote adoption of antibiotic stewardship in professional curricula by faculty in colleges of human and veterinary medicine
- Promote a culture of antibiotic stewardship as an integral part of continuing education and clinical practice for practicing providers and professionals
 - Physicians, physician assistants, nurses, nurse practitioners, dentists, pharmacists, health care administrators, and others

NAP Goal 1 Objectives: 1.1-1.3

- 1.1 Implement public health programs and reporting policies that advance antibiotic resistance prevention and foster antibiotic stewardship in health care settings and the community
- 1.2 Eliminate the use of medically important antibiotics for growth promotion in food producing animals and bring under veterinary oversight other in-feed and in-water uses of antibiotics that are medically important for treatment, control, and prevention of disease
- 1.3 Identify and implement measures to foster stewardship of antibiotics in animals

NAP Goal 1.1 Objectives: Notable Federal Activities in Human Antibiotic Stewardship and Prevention of Antibiotic Resistance

- CMS CoP requiring ASPs in inpatient settings and new infection control standards that require ASPs in LTCFs
- CDC Core Elements documents for AS
- CDC NHSN survey on national uptake of ASPs
- CDC funding to build core HAI/AR detection and response infrastructure in every state and support State HAI/AR Prevention Programs in up to 25 states

Continued...

- Continued refinement of CDC NHSN AUR module to collect risk adjusted antibiotic use data
- AHRQ implementation guide for AS in LTCFs
- Active implementation of ASPs in DoD and VA facilities
- Expanded funding to CDC, AHRQ, and NIH for research in development and implementation of interventions to address drivers of the emergence and spread of antibiotic resistance and misuse of antibiotics

Antibiotic Stewardship Recommendations

- Ensure the development of evidence-based ASPs that are positioned to drive change
 - Content of Interpretive Guidelines for CoPs and training of surveyors critical
- Enlarge and train the ID physician and pharmacist AS workforce
- Enhance collaboration between CMS Quality Improvement Networks and Hospital Engagement Networks and CDC State HAI/AR Prevention Programs
- Increase attention to AS in outpatient settings
- Investigate which educational messages are the most likely to induce behavior change among prescribers and consumers and identify the appropriate groups and messengers to deliver the messages
- Ensure sustained funding

Surveillance Recommendations

- Ensure continued, stable funding of federal and state surveillance programs
- Coordinate by the CDC which data are collected, analyzed, and acted upon among the HAI/AR Prevention Programs to ensure that important trends in AR are detected and controlled across regions
- Address the challenge of relying on health care institutions to voluntarily provide information and bacterial isolates
- Increase the number of hospitals reporting antibiotic use data via the NHSN AUR module and validate the quality metric for hospital antibiotic use endorsed by the National Quality Forum
- Develop methods to assess appropriate antibiotic use at the prescriber level in outpatient settings

Research Recommendations

- Fund research on the most effective approaches to perform antibiotic stewardship, to influence and to predict prescriber behavior, and to prevent the spread of antibiotic resistance in acute care, long-term care, and ambulatory settings
- Translate the knowledge gained from research into tools for broad use
- Develop a pipeline of research in this area through funding of investigators to promote a career track in AS/AR activities

NAP Goal 1.2 Objectives: Notable Federal Activities in Eliminating Use of Medically Important Antibiotics for Growth Promotion

- FDA's overall strategy on combating antimicrobial resistance (AMR) is on track to successfully remove all growth promotion uses of medically important antibiotics by the end of 2016
 - Guidance for Industry (GFIs) #209 and #213 will bring the uses of these drugs for prevention, control, or treatment under veterinary supervision so that they are used only when necessary for assuring animal health.

NAP Goal 1.2 Objectives: Recommendations

- Work toward consensus processes for establishing metrics for the appropriateness of antibiotic use, especially antibiotics used for preventative purposes
- Work to insure such metrics are interpreted appropriately by all stakeholders when the required data become available
- Reconcile concerns about confidentiality of producers and specific farms

NAP Goal 1.3 Objectives: Recommendations

- USDA and FDA should ensure financial and educational support of outreach efforts undertaken by the agricultural extension services and the nongovernmental organizations already engaged in driving antibiotic stewardship in veterinary medicine
- Antibiotic use in companion animals should be considered a focus of stewardship activities

Conclusion

- Thank you to all WG 1 members:
Angela Caliendo, Alicia Cole, Peter Davies, Lonnie King, Rich Carnevale (AHI), Jay Butler (ASTHO), Sherrie Dornberger (NADONA), Elizabeth Jungman (Pew), John Clifford and Neena Anandaraman (USDA), Paige Waterman (DoD), Michael Craig (CDC), Dennis Dixon (NIAID), Peter Lurie and Bill Flynn (FDA), and Jim Cleeman (AHRQ).

Questions?

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Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Initial Assessment of Progress toward Goal #2: Workgroup on One Health Surveillance

WG Chair: Elizabeth Jungman, The Pew Charitable Trusts

WG Vice Chair: Peter Davies, University of Minnesota

Goal 2: Broad Recommendations

- Address disparity in progress on human and animal objectives
- Address data sharing challenges for human stewardship
- Explore partnerships to collect on-farm data
- Develop a strategy to address environmental surveillance
- Expand coordination and collaboration
- Inadequate funding is a challenge

A One Health Approach

- Greater integration of animal and human surveillance
 - Laboratories
 - Repositories
- A strategy on environmental surveillance is needed

NAP Goal 2 Objective 2.1

2.1 Create a regional public health laboratory network to strengthen national capacity to detect resistant bacterial strains and a specimen repository to facilitate development and evaluation of diagnostic tests and treatments

Public health laboratory network

- Progress:
 - CDC is expanding regional surveillance network and integrating AR Regional Labs
- Recommendations:
 - Significant investment in lab equipment and personnel will require funding
 - Regional partnerships are critical

Goal 2 Objective 2.1

Repositories

- Progress:
 - DOD is expanding access to its Multidrug-resistant Organism Repository and Surveillance Network (MRSN) database (37,000 characterized isolates; 3,000 genomes)
 - CDC/FDA repository ahead of schedule (220 isolates currently, goal 800)
- Recommendations:
 - Ensure DOD funding to continue data collection efforts
 - Collaboration between DOD and CDC/FDA repositories

Goal 2 Objective 2.2

2.2 Expand and strengthen the national infrastructure for public health surveillance and data reporting, and provide incentives for timely reporting of antibiotic-resistance and antibiotic use in all healthcare settings.

National Healthcare Safety Network (NHSN)

- Progress:
 - ONC Rule requires HIT to include AU and AR
 - Antibiotic use measure endorsed by National Quality Forum
 - Patient Safety Atlas launch
- Recommendations:
 - Incentives to report into NHSN will be important
 - Funding needed for DOD and VA to expand number of facilities reporting into NHSN

Continued: Objective 2.2

Emerging Infections Program

- Progress:
 - Population-based surveillance data collection is ongoing
 - Data collection for Multistate Point-Prevalence Survey of HAIs is on track
 - Survey for long-term care facilities will launch in 2017
- Recommendations:
 - Funding for states will be important to continue these efforts

Goal 2 Objective 2.3

2.3 Develop, expand, and maintain capacity in State and Federal veterinary and food safety laboratories to conduct antibiotic susceptibility testing and characterize select zoonotic and animal pathogens.

Surveillance

- Progress:
 - Active surveillance via National Antimicrobial Resistance Monitoring System
 - Passive surveillance of *Salmonella* isolate surveillance via National Veterinary Services Laboratories (NVSL) funding dependent
- Recommendations
 - Define pathogen targets and participation criteria for laboratories
 - Define needs and scope of a strategy for animal pathogens

Continued: Objective 2.3

Surveillance

- Progress:
 - Ongoing collaboration to assess Antibiotic Susceptibility Testing (AST) capabilities
 - Substantial AST currently occurs in state laboratories
- Recommendations:
 - Address procedural obstacles (e.g. data confidentiality)
 - Funding for longer-term milestones

Goal 2 Objective 2.4

2.4 Enhance monitoring of antibiotic-resistance patterns, as well as antibiotic sales, usage, and management practices, at multiple points in the production chain for food animals and retail meat.

Data Collection

- Progress:
 - Sales data by species proposed – still need use data
 - Efficiency gains in sampling and testing have allowed FSIS to enhance NARMS
- Recommendations
 - Funding for farm-level data and surveillance
 - Be aware of the time lag!

Conclusion

- Sustained funding, coordination and collaboration is essential
- Rectifying the imbalance between human and animal settings, and developing a plan for environmental surveillance, are necessary to a one-health approach
- Partnerships with state and local agencies and other stakeholders will be important

Working Group



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Questions?

Initial Assessment of Progress toward Goal 3: Workgroup on Diagnostic Innovations

WG Chair: Angela M Caliendo, MD, PhD

WG Vice Chair: John Rex, MD

Goal 3: Broad Recommendations

- Devise economic incentives that encourage and support providers to use diagnostic tests to guide therapy.
- Develop new payment models for diagnostics that encourages their use in guiding therapy rather than the empiric use of antibiotics.
- Cultivate robust collaborations between microbiology labs and antibiotic stewardship programs (ASPs).
- Identify mechanisms and approaches to reduce the cost of clinical studies of diagnostic devices and streamline the regulatory process.
- Craft a comprehensive strategy for funding outcomes studies.
- Train healthcare providers on how to better use and interpret results of diagnostic tests.

A One Health Approach

- Support the development of diagnostics that will allow veterinarians to differentiate viral and bacterial infections and more accurately prescribe antibiotics.
- Create incentives for the development of animal diagnostics for both the animal food industry and companion animals and for assessing the utility of human diagnostics in animals.
- Give providers in all disciplines that use antibiotics the tools and education on diagnostics to encourage their appropriate use and to reduce waste and inappropriate use.

NAP Goal 3 Objective: 3.1

Federal Activities:

- NIAID is funding many research grants specifically focused on bacterial species identification and antibiotic susceptibility testing.
- NIAID has funded and continues to fund the development of rapid diagnostics for viral respiratory tract infections, which can help clinicians make treatment decisions that curtail the overuse of antibiotics.
- While most federally-supported diagnostics research efforts were initially focused on biothreat pathogens, the progression toward studies focused on preventing and treating the more common multidrug-resistant organisms (MDROs) in recent years is encouraging.

Continued...

Federal Activities:

- The NIAID-funded ARLG has a variety of projects in progress with emphasis on diagnostics.
- “Rapid Diagnostics in Categorizing Acute Lung Infections” and “Use of Procalcitonin Testing to Direct Antibiotic Use in Lower Respiratory Tract Infections”; assess diagnostics for common outpatient infectious disease syndromes, which represents a largely unmet need.
- The ARLG is also conducting innovative clinical trials in which tests from multiple companies are included in a single clinical study (involving a master protocol). Although the studies are complex, the ARLG has the infrastructure to conduct this work.

Continued...

Federal Activities:

- The ARLG is also funding critical studies to evaluate the real-world implementation of new diagnostic tests. For example, a study on the clinical and economic outcomes of the FilmArray Blood Culture Identification Panel used in combination with antimicrobial stewardship. The Rapid Diagnostics for Gram-Negative Bacilli in Blood project, currently in development, will build upon these findings.
- BARDA and NIH are working together to create a prize for the development of a rapid diagnostic test that can improve treatment of drug-resistant infections.

NAP Goal 3 Objective 3.1 Recommendations

- Fund studies of diagnostics focused on rapid genotypic and phenotypic detection of multi-drug resistant organisms (MDROs), rapid testing for distinguishing bacterial and viral pathogens, and detection and identification of major individual pathogens.
- For the many solicitations announced, include as part of the scoring criteria the need to demonstrate that tests can be more generally applied so that promising technologies can be adapted for MDROs and important pathogens, and give such tests higher priority for funding.

Continued: Objective 3.1 Recommendations

- Consider creating two distinct award tracks under the BARDA/NIH development prize:
 - Prize 1 to address hospitalized patients infected with MDROs. Prioritize tests allowing for early detection of the presence or absence of resistance genes that can be used to direct the initial dose(s) of antibiotics.
 - Prize 2 to focus on a rapid simple test that can be used in the outpatient setting to distinguish between bacterial and viral infections. Such a product could greatly reduce outpatient antibiotic usage for extremely common upper respiratory infections and acute otitis media.

Continued: Objective 3.1 Recommendations

- Fund outcomes studies to show the utility of diagnostic tests to allow for precision of antibiotic prescribing practices.
- Lower the barriers to test development for commercial companies.
- Create care pathways that provide guidelines on the use of diagnostic tests.

NAP Goal 3 Objective 3.2

Federal Activities:

- FDA and CMS have implemented a parallel review program and recently refreshed their memorandum of understanding.

Recommendations:

- Support innovative approaches to payment. The development of an alternative economic model for diagnostics that can help reduce antibiotic resistance is critical.

Continued: Objective 3.2 Recommendations

- The wide variations in reimbursement among the different insurance carriers should be addressed.
- The lack of American Medical Association Current Procedural Terminology (CPT) codes impacts reimbursement and uptake of these tests into clinical practice. The need to expand CPT codes available is tied to the innovative approaches to payment; part of the expansion includes simplifying and making the process of obtaining new CPT codes more transparent.

Continued: Objective 3.2 Recommendations

- In general, there is a need to better align the FDA and CMS review processes to increase the likelihood of moving the above programs forward.
- Develop a program to educate clinicians on the value, appropriate use, and interpretation of diagnostic tests, and promulgate professional guidelines to address the role of diagnostics.
- Coordinate implementation and use of rapid tests with ASPs, particularly for inpatients.

Conclusions for both Human and Animal Health

Summary:

- Though an array of technologies exist or are under development, there is a need for rapid tests to distinguish viral from bacterial infections and identify MDROs.
- Widespread adoption and implementation will be encouraged by ongoing scientific investigation but will not actually occur unless we provide suitable incentives and reimbursement mechanisms.

Thank you to all WG 3 Members!

Martin Blaser, Aileen Marty, Sara Cosgrove, Robert Weinstein, Alicia Cole, Rodney Wallace (BARDA), Dennis Dixon and Jane Knisely (NIAID), David Goldman and Neena Anandaraman (USDA), Peter Lurie and Steve Gitterman (FDA), Paige Waterman and Matthew Hepburn (DoD), Michael Craig and Jean Patel (CDC)

Questions?

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Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Initial Assessment of Progress toward Goal 4: Workgroup on Treatment, Prevention, and Control R & D

WG Chair: Helen Boucher
WG Vice Chair: Kent Kester

Goal 4: Broad Recommendations

Appreciating the importance of prioritizing stewardship and prudent use of available therapies to treat AMR pathogens, we recognize that new antibiotics are needed as the current ones are becoming less effective and that suitable reward models must be in place to depict the value an antibiotic has, both when it is used to treat an infection and when it is available in case it is needed

- Potential incentives and advances relevant to the value of both in-use and in-existence novel antibacterial therapies include:
 - “delinkage” of the return on investment that depends on sales volumes
 - consideration of more traditional incentives, such as tax credits, competitions, and prizes
- Currently, there are a limited range of approaches to developing oral antibiotics and no viable economic model for developing antibiotics in general

Continued...

Accelerate antimicrobial R&D in the pursuit of narrow-spectrum antibacterial agents

- NEEDED: New regulatory guidance and addressing of financial disincentives
 - Reliable clinical and regulatory pathways for the development of narrow-spectrum agents do not exist, nor is there a viable financial model for their development/deployment
- The potential value of narrow-spectrum agents for treatment of common infections, coupled with accurate diagnostics, could further stewardship practices because they might promote less resistance
- Efforts to resolve this challenge are urgently needed
 - The Limited Population Antibacterial Drug (LPAD) pathway currently pending in Congress, while not a complete solution, would be a meaningful step towards enhancing feasibility of development programs for narrow-spectrum antimicrobials

Continued...

Capitalize on opportunities for collaboration across the USG in provision of key data and materials to support development of promising antibacterial drug candidates and vaccines

- While NIH and BARDA provide a number of services to companies interested in product development, security and data sharing concerns are key barriers to progress in this area
- Owing to complex government agency barriers, the ability for the various USG CARB efforts to freely share data and resources is somewhat limited
- A standardized process for information and specimen sharing among the various participating agencies that would simplify collaboration is needed

Continued...

Address barriers to progress in developing and launching public-private partnerships aimed at enhancing development of novel antimicrobial agents.

- Includes perceived and real disincentives for sponsors and challenges in coordination between USG agencies with regard to specimen sharing, database development and data access, and maintenance. Cultural barriers to partnering among private industry, academia, and the government should also be addressed to enable successful partnerships

Ensure harmonization of programs to allow for global development and use of therapies for AMR.

Consider opportunities of leveraging the data gathered from basic research efforts that are no longer pursued for human applications.

- Could also include modifying clinical candidates and pursuing development of these agents for animal indications

A One Health Approach

Support additional research to enhance understanding of basic science questions and relevant environmental factors that facilitate development of AMR and spread of resistance genes common to animals and humans

- More interagency emphasis on collaborations between the human and animal sectors at the basic research level. Common biology, chemistry, testing approaches, and related matters allow for diversity of input and leveraging of human capital, physical resources, and funding

Leverage opportunities for enhanced USG emphasis on the One Health approach, which connects human, animal, and environmental sectors

- Require additional coordinated efforts and initiatives among FDA, USDA, NIH, and CDC that better reflect the One Health approach by sharing information, technology, and applications across the sectors
- The One Health offices within USDA, CDC, and FDA should further coordinate their plans and activities and focus collaboratively on common AMR issues. Refine collaborations and leverage technology by including the animal health sector both in public-private partnerships arrangements and incubators

Objectives 4.1-4.7: Progress and Activities

4.1 Conduct research to enhance understanding of environmental factors that facilitate the development of antibiotic resistance and spread of resistance genes that are common to animals and humans

- In clinical trials networks, NIAID will continue work with FDA and industry/academic partners to explore developing a more robust clinical trials infrastructure and assess the feasibility of applying common clinical protocols for evaluation of multiple products
- BARDA RFI (Feb 2016) to solicit cost and technical data to establish a clinical trials network that would utilize a common clinical trial protocol; focus on conducting Phase II/III trials in traditional indications against susceptible pathogens but would utilize a common control arm, reducing time and cost to conduct these trials

4.2 Increase research focused on understanding the nature of microbial communities, how antibiotics affect them, and how they can be harnessed to prevent disease

Continued: Progress and Activities

4.3 Intensify R&D of new therapeutics and new/improved vaccines, first-in-class drugs, and new combination therapies for treatment of bacterial infections

- Strategies for discovery of new agents should be managed independently to ensure diversity of approaches
- Later stages of clinical development may be usefully coordinated
 - A variety of strategies may be required to reinvigorate the pipeline
 - An example of this is the recent BARDA initiative to consider creation of several clinical trial networks for testing of new antibacterial agents
 - Existing NIAID Vaccine and Treatment Evaluation Units are a good example of a coordinated development resource

4.4 Develop nontraditional therapeutics, vaccines, innovative strategies to minimize outbreaks caused by resistant bacteria in human and animal populations

Continued: Progress and Activities

4.5 Expand ongoing efforts to provide key data and materials to support the development of promising antibacterial drug candidates and promising vaccines that can reduce the need to treat bacterial infections

- DoD's MRSN is the largest USG repository of well-characterized AMR organisms. Unexpected deletion of funding in 2016 National Defense Authorization Act imperils the significant role DoD plays in the overall federal AMR response
- Recent BARDA RFI on pragmatic clinical trials network for registration trials using master protocol for core indications that can be used to enable product registration (e.g., cUTI, cIAI, HABP/VABP) with US patients
- Therapies for other infections could be studied efficiently in parallel protocols

4.6 Enhance opportunities for public-private partnerships to accelerate research on new antibiotics and other tools to combat resistant bacteria.

- BARDA announcement, Sep, 2015: antibiotic portfolio partnership with AstraZeneca

Continued: Progress and Activities

4.7 Create a biopharmaceutical incubator—a consortium of academic, biotechnology, and pharma partners—to promote innovation and to increase antibiotics in the development pipeline

- Feb 2016: BARDA/NIAID funding opportunity announcement to establish CARB Biopharmaceutical Accelerator
 - Novel PPP to support R&D to accelerate development of drugs, vaccines, & diagnostics
- Continuance of this initiative and the provision of funding for this and future innovative incubators are imperative; will spur innovative development at all stages, including higher risk early programs and more costly full development programs.
- These efforts will be further enabled by creations of the clinical trials network now being explored by BARDA.

Workgroup # 4: Conclusion

- We are excited by the progress of our USG colleagues in these 18 first months, especially by NIAID and BARDA collaboration and progress toward creation of
 - The biopharmaceutical incubator, and
 - The clinical trials network now being explored by BARDA
- Engagement of a wide range of experts, including experienced discovery scientists, developers, regulators and business leaders, as well as support in the form of human and financial resources, will be critical to success of the partnership

Thank You – WG Members

- Martin Blaser
- John Rex
- Ramanan Laxminarayan
- Randy Singer
- Tom Shryock
- Rich Carnevale (AHI)
- Jay Butler (ASTHO)
- Joe Larsen (BARDA)
- Dennis Dixon (NIAID)
- Jane Knisely (NIAID)
- Francois Franceschi (NIAID)
- Steve Kappes (USDA)
- Neena Anandaraman (USDA)
- Peter Lurie (FDA)
- Ed Cox (FDA)
- Edward (Charles) Bane (DoD)
- Paige Waterman (DoD)
- Michael Craig (CDC)
- Jean Patel (CDC)

Questions?

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Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Initial Assessment of Progress toward Goal 5: Workgroup on International Collaboration on CARB

WG Chair: Dr. Ramanan Laxminarayan

WG Vice Chair: Dr. Thomas Shryock

Goal 5: Broad Recommendations

- Measure the effectiveness of the international strategy in reaching NAP goals in the next phase by choosing a few indicators that clearly measure outcomes of interest (in addition to the current process and output indicators)
- Ensure that resources commensurate with NAP international collaboration goals are provided to the relevant USG agencies.
- Expand involvement to include additional countries beyond those already engaged.

Goal 5: Broad Recommendations

- Leverage the expertise and resources of a range of nongovernmental assets.
- Broaden the currently narrow actions related to animal health to a more comprehensive One Health perspective.
- Expand engagement with other governments, pharmaceutical and diagnostic industries, and academia across the world in R&D.

A One Health Approach

- Environmental aspects of antibiotics and antibiotic-resistant bacteria should be considered.
- Broaden the currently narrow actions related to animal health to a more comprehensive One Health perspective.
- A common understanding of One Health on a global basis is needed.

A One Health Approach

- Pursue the opportunity to improve the infrastructure for animal health in key countries, similar to efforts to improve public health capabilities.
- An aligned inter-agency One Health strategy and resourcing in U.S. global engagement is lacking – consider how to connect resources/funding to One Health efforts.

Objectives 5.1 - 5.4: Recommendations

Surveillance

- Expand surveillance to include molecular typing and transmission tracing.
- Expand surveillance to support systems outside US and Europe, in countries that are the likely incubators for new antibiotic-resistant bacteria that can spread worldwide.
- Look to the already successful U.S.-E.U. experience as a learning opportunity for guiding partnerships with other regions.
 - Involve private sector and laboratories

Continued: Surveillance Recommendations

- Harmonize interpretive categories (e.g., definition of resistance).
 - include representation from the animal sector for animal disease pathogens to complement the work of CDC.
- Support research on country-specific and regional drivers of antibiotic resistance.
 - includes cost-effective interventions, operational research to adapt strategies to diverse settings, and continued evaluation of interventions.

Objective 5.5: Recommendations

Research and Development

- NIAID, NIH and BARDA participation in International R&D efforts
 - Specifically: IMI in Europe; TATFAR; Indian MRC
- Strengthen the emphasis on animal health product research efforts with USDA or other agencies at a basic research level.
- Enhance engagement with private-sector partners

Objectives 5.6-5.8: Recommendations

Prevention & Control

- 5.6 Advancement of GHSA and WHO GAP; support for country-level NAPs by DoS, USAID, FDA, USDA
- Ensure continued engagement with national governments that includes development of implementable policies.
 - Share practical experience with additional countries from work done already
- 5.7 No Year 1 milestones; USAID support for work in the area has been ongoing

Continued: R&D Recommendations

- 5.8 Coordination of international regulatory approaches (mainly) for animal health applications by USDA and FDA
 - Examples: VICH, Codex, IMDRF, ICAB
- Harmonize NAP objectives with those of international organizations and prioritize the goals of greatest importance for near-term work.
- Align global organization programs to allow for harmonization of regulatory pathways and studies for animal health products.

Conclusions

- Significant progress has been made on WG5 objectives but much needs to be done to keep up with ambitious targets.
- Looking to the future
 - Expand involvement to include additional countries beyond those already engaged.
 - Measure the effectiveness of the international strategy in reaching NAP goals in the next phase by choosing a few indicators that clearly measure outcomes of interest (in addition to the current process and output indicators).

Thank you to all workgroup members!

Mike Apley, Helen Boucher, Aileen Marty, Liz Wagstrom (NPPC), John Clifford and Neena Anandaraman (USDA), David Smith (DoD), Michael Craig and Jean Patel (CDC), Dennis Dixon (NIAID), Peter Lurie and Marie Lou Valdez (FDA), Lynn Filpi (OGA), and Jessica Petrillo (State).

Questions?

PACCARB

Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Overarching issues and recommendations

PACCARB Chair: Martin Blaser

PACCARB Vice Chair: Lonnie King

PACCARB

Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria

Fully embrace a One Health approach

One Health is defined as multiple disciplines and professions working to achieve optimal health in the human, animal, and environmental domains. The relationship between humans and domesticated animals in the transmission of microbes is a central principle in any rational approach to solving AMR.

- All 5 WGs stressed this principle, but efforts in animal and human health remain disconnected.
- One Health must be seen as an organizing principle.
- New approaches are clearly needed.
- Interdisciplinary integration and dialogue between veterinary and human health institutions and subject matter experts needs to become more frequent and in-depth.

A lead federal champion of the CARB initiative

In its enormous breadth and scale, many of the USG activities take place in silos. To maximize efficiency and productivity, there needs to be improved coordination and collaboration. Leadership is critical to overcoming challenges. There is need for a champion in the USG to align all of the agencies and to move the work forward efficiently and with synergies.

- A champion could be at the level of the White House, a Cabinet Secretary or Department Undersecretary, with sufficient gravitas and authority to bring the relevant parties together.

Coordination of the federal response

The importance of a coordinated effort across agencies and departments cannot be minimized.

- Although there have been many notable successes, PACCARB found that centrally coordinated mechanisms were not sufficient to ensure maximum synergy, avoidance of duplication, and coverage of all key points.

Resource allocation

Combating AMR requires an adequate resource base to slow down, control, and reverse the problem. The USG must commit sufficient resources to solving the problem with long-term funding. Each of the WGs found that key elements necessary to achieve the NAP goals are underfunded. Potential solutions could involve a combination of the following:

- New monies authorized from Congress.
- Re-budgeting within departments and agencies.
- Re-allocating full-time employees between agencies to reduce redundancy while increasing communication and productivity.

Development of critical partnerships

The USG does not have sufficient resources, omniscience about the problems, or a sufficient pool of expertise to unilaterally solve the problem of AMR. PACCARB underscores the utility of establishing effective partnerships with:

- States, local agencies, and tribes
- Private sector organizations and commodity groups
- Philanthropic organizations
- International governmental bodies and organizations

Economic incentives for developing and deploying new diagnostic, preventive, and therapeutic tools

Solving AMR will require new modalities, such as new antibiotics, vaccines, and diagnostics. Despite steps to promote such development, PACCARB believes that the current economic model is inadequate to ensure the availability of antibiotics to treat antibiotic-resistant infections, and to prevent their emergence. These challenges will require:

- Incentives at different levels for proper stewardship to avoid unnecessary treatment (e.g., for viral infections).
- An economic and commercial model that takes into account the full societal costs of AMR and that provides adequate incentives to ensure the development and deployment of new therapies, preventives, and diagnostics.

Thank You

PACCARB

Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria