Report:
CDC AMD Day &
CDC Board of Scientific Counselors, Office of Infectious Diseases

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CLIAC Liaison

Nov 2-3, 2016

CLIAC Meeting

3rd Annual Advanced Molecular Detection AMD Day (Sept 26, 2016)

- Highlight Milestones of 2014 Federal AMD Initiative & Promote Info Exchange
  - Accelerate, coordinate, and support the rollout of advanced laboratory technologies, such as NGS, in state and federal PH agencies and to develop the necessary IT, bioinformatics, and workforce capacity to sustain them into the future.
- Key Note Speaker: Derrick Crook, WGS of Tb in UK
  - TB first place WGS will replace traditional workflow
  - Changing supporting infrastructure within PH system
  - Need for interoperable data so it can be shared WW [bioinformatics biggest bottle neck]
  - Complete transformation of microbiology practice
- Examples of NGS Posters: Serotype Salmonella, CRE analysis in the US, NextGen PulseNET, Tracking C diff transmission, Universal Parasite Dx, emerging GC resistance, Patterns of TB transmission, Routine Bacterial Identification in PH laboratory
- Dr Thomas Frieden – "Next Generation Thinking"

http://www.cdc.gov/amd

BSC/OID Meeting included reports on [Sept 27-28, 2016] :

- National Center for Immunization & Respiratory Diseases (NCRID)
- CDC's ZIKA response
- National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)
  - Center Updates with Focus on Antimicrobial Resistance (AR) activities
- National Center for HIV/AIDS, Viral Hepatitis, STD & TB prevention (NCHHSTP)
- Discussion with CDC Director Dr Thomas Frieden
- Center for Global Health
- OID Planning for the Future
  - Center Updates, with focus on Global Health Security Agenda
- Food Safety Modernization Act Surveillance Working Group (FSMA SWG)
- Hepatitis C Virus Updates

National Center for Immunization & Respiratory Diseases (NCRID)

Nancy Messonier, Director

- Immunization Coverage
  - Vaccination continues to have a dramatic impact on childhood preventable diseases (MMWR Jan 2016)
  - Children 19-35 mo with no vaccination nationally remains high
  - Disparities remain; Socioeconomic & Urbanicity [access to care]
  - HPV: After 10 yrs of coverage vaccination uptake has been slow [56% ; goal is 80%], Provider-level interventions are effective but hard to measure, updated adolescent immunization measures with HEDIS 2017
  - Adult Vaccination: Flu coverage has dipped, Overall coverage could be better
- Modernizing Immunization Practice through Investment & IT
- Powerful Partnerships to Accelerate HPV uptake, Merck's direct to consumer Ads, Effort to get adolescents back for 2nd Vaccine
- Education Materials for Parents & Providers
- Promise of improved health coverage and documentation of vaccination

National Center for Immunization & Respiratory Diseases (NCRID)

Nancy Messonier, Director

- Challenges
  - Measles OB Detention Center in AZ [1425 detainees, 22 cases among staff & Detainees], Staff under immunized [critical reminder for everyone's immunization to be up to date]
  - Pertussis on rise in US: Acellular vaccine wanes immunity & doesn't impact herd immunity
  - Nasal vs IV Flu Vaccination; APIC recommendation against FLUmist vaccine for children
- New Programs & Priorities
  - New Vaccine Programs; HPV [reduced dose], Shingles, RSV
  - AMD innovations on WGS Flu Surveillance
  - Promoting Legionella Water management On-line tools available [> 7K downloads since June], Need for Rapid Environmental Testing

CDC Response to ZIKA: Panel Discussion

Beth Bell, Coleen Boyle & Lyle Peterson

"Never before in history has there been a situation when a bite from a mosquito could result in a devastating malformation."

- Thomas Frieden, April 13, 2016

CDC Response to ZIKA: Panel Discussion

Beth Bell, Coleen Boyle & Lyle Peterson

- Pregnant women with lab evidence Zika: 749 (US), 1,348 (US Territories)
- ArboNET Zika Case reporting: Cases in every State but Alaska
  - Locally Mosquito-borne cases: 43
- Multi-disciplinary response: CDC Emergency Response, Surveillance, Vector Control, Pregnancy & Birth Defects Risk communication, Laboratory Dx, Blood Tissue specimens
- Several examples of interim guidance available: Update quickly as new information is learned
- Diagnostics Testing:
  - RT-PCR: viral PCR serum & urine collected <14 days post-onset.
  - Serology for IgM & neutralizing Ab in serum 2-12 wks after onset of illness.
  - Difficult to distinguish against other flaviviruses
- CDC Zika Dx Assays: EUA for two CDC assays : MAC-ELISA (IgM) & Triplex rRT-PCR.
  - Distributed Domestically through LRN
  - Distributed internationally
- Commercial Kits EUA:
  - RNA (7), IgM (1)
  - 3 Commercial Laboratories have licensed CDC Zika MAC-ELISA [1st time in History]

CDC Response to ZIKA: Panel Discussion

Beth Bell, Coleen Boyle & Lyle Peterson

- *Aedes aegypti*: Yellow Fever Mosquitoes
  - Feeds on multiple people in one feeding, limited flight range, spotty OBs, difficult to control
- Vector Control Challenges Wynwood, Florida:
  - People are very mobile, Live in different places but work in similar area
  - New approach to vector control:
    - Aerial spraying with alternative agents [naled & Bti] demonstrated dramatic impact of control in modern era
  - Concerns of effects but no increase in ED visits
- Need for improved vector control programs and core competency
  - Need to address vector control capacity needs
  - Data to support operational decisions ie Local information on insecticide resistance
  - Improved methods for control of *Aedes aegypti*

CDC Response to ZIKA: Panel Discussion

Beth Bell, Coleen Boyle & Lyle Peterson

- Zika is a cause of Microcephaly- Congenital Zika syndrome with cognitive anomalies
- Zika in Pregnancy: Pregnant women no more susceptible, no evidence of more severe disease
- Interim Guidance Available: For providers to evaluate pregnant women as well as evaluate & manage Infants with possible congenital Zika
- Supporting Providers with Tools: Guidance & recs, 24/7 clinical hotline, CDC INFO at web and call in for providers & general public
- Pregnancy task force: On-going research & knowledge gaps
- Range of health problems unknown, level of risk during pregnancy & when in pregnancy highest risk, additional factors for risk to birth defects
- US Zika pregnancy registries to monitor pregnancies & health outcomes
- Zika contraception access network: Goal to delay or avoid pregnancy during OB

National Center for Emerging & Zoonotic Infectious Diseases

Beth Bell, MD, MPH

- Antibiotic Resistance (AR) – 160M FY16 AR Activities
- Build & expand HAI prevention solutions: Pt Focus moving from an individual to regional approach [where a pt goes in HC system will impact other areas of HC system]
- Partnering with states with success strategies to build on those tools, expand on HAI/AR programs in every state via detection, response, prevention & stewardship
- National standard for outpt Abx prescriptions [CARB National Plan]
- Creating a CDC AR Laboratory Network (ARLN): Nationwide testing to fill gaps, track, surveillance & collect data in era of CIDT
- CDC & FDA AR isolate bank for New Dx & Abx development [211 orders since July 2015]
- Advanced Molecular Diagnostics (AMD): WGS improvements within PH, AR patterns & trends. Building capacity to fight foodborne Infections [Listeria], workforce development
- Additional “Threats” Resistant GC & Tb

National Center for Emerging & Zoonotic Infectious Diseases

Beth Bell, MD, MPH

- Sepsis: Epi-Aid investigation to better understand characteristics of sepsis pts. Conclusion: Improved infection prevention strategies in HC system have substantial impact on reducing sepsis [vaccination, decreased HAI transmission, appropriate management of chronic diseases]
- Continued sepsis campaigns, consistent sepsis definition for surveillance, est national sepsis burden estimates & trends, improved interventions & engage with clinician & public on awareness.
- Outbreaks: *Elizabethkingia* OB [in Wisconsin] still looking for source, *Candia auris* , mcr-1 in human and food sources, *E.coli* in Flour, Listeria in frozen foods [supplier environment my contribute to sporadic cases]
- Ebola Research: Liberia men's screening, biomarkers in EVD pts

National Center for HIV/AIDS, Viral Hepatitis, STD & TB prevention

Jonathan Merimen, MD

- HIV: Domestic external peer review panel, state & local program monitoring, evaluation & improvement. Data to care to improve outcomes, molecular epi to maximize HIV prevention
- ARV postexposure prophylaxis guidelines updated: Postexposure prophylaxis regimes have been updated
- Hepatitis: Surveillance report & new technology
  - HBV relatively stable, new cases of HCV
- Syringe Service Programs (SSP): Guidance releases on components of SSPs to prevent spread of HV & viral hepatitis
  - New Users with SSP syringes 5X more likely to dispose of used syringes safely

National Center for HIV/AIDS, Viral Hepatitis, STD & TB prevention

Jonathan Merimen, MD

- 2016 Recommendations on LTBI Screening;
  - Recommended for LTBI populations with increased risk, applies to asymptomatic adults > 18yrs at increased risk for TB and seen in primary care
- Revised self study modules on Tuberculosis, reflect CDC guidelines & focus on educating HC workers
- First national LGB HS student health related behaviors released:
  - Higher rates of physical/sexual violence and bullying than peers [4X more likely to have attempted suicide],
  - 5% reported illegal drug use [5X higher] & 6% heroin [4X higher]
- New Gonococcal Isolate Surveillance Project (GISP) data:
  - 300% increase in decrease susceptibility to azithromycin from 2013-14.
  - 7 cases in HI with resistance to azithromycin & decreased susceptibility with ceftriaxone
  - 3 new drugs in pipeline

Hepatitis C: A time to Test & Cure

John W. Ward, MD

- Twin Epidemics: Baby boomer & PWID [predominantly white & live in rural areas; opioid abuse to heroin], Infants both to HCV infected women on rise [Ky as much as 124% increase from 2011- 2014]
- Silent disease, new Tx strategies with goal to eliminate disease but cost of Tx hampering ability to fight Dx , costs are coming down and cost of Tx becoming cost neutral
- Baby boomer testing strategy; 93% reduction in mortality with decreased transmissions
- More work to do but lack of safety nets. Improved access to HCV testing, care & cure can have a big impact (So Philly)
- GHOST [Global Hepatitis OB & Surveillance Technology] reveals transmission network overlaps with HIV transmission, prevention and transmission by IDing social network
- Disconnect with services & clusters of disease
- National Academies of Science, eliminating PH problem of Hep B & C in the US phase I report (April 11, 2016) must ID & eliminate barriers
- Points of Discussion: (1) Address local critical issues (2) Expanding reflex testing to increase Dx (3) Response to OB (like HCV) as part of emergency preparedness

Updates from CDC Director

Thomas Friedan, MD

- Need for an emergency rapid-response fund for infectious diseases
  - Would allow the ability to stop an OB sooner, would dramatically reduce human and economic costs
- Zika: In addition to pregnant women and affected infants, young children who may have been infected are also of increasing concern
- AMD initiatives: New model of collaboration, need for more economic impact models
- LTBI shorter regimens are needed
- United Nations AR discussions, need to decide next steps, some countries are better at stewardship than others.
- Four key components to combating AR: 1) Laboratory Network, 2) Surveillance Network, 3) Stewardship & 4) Infection Control
  - Campaigns to raise awareness as it is pt & physician behavior that needs to change
  - AR likely worse than we realize

Center of Global Health Update

Rebecca Martin, PhD

- Global Health Security Agenda: Prevent, detect & respond, if can't prevent must be able to detect and need workforce
- US Global Health Security Agenda Partner Countries: 31
  - Improved scorecards, field epi training programs and global response activities
- Milestones:
  - Assessment, monitoring & evaluation,
  - curriculum & training
  - System implementation & cross sectional training
- Examples: India Improved Dx, Tx & Px of DR-Tb [flagship example of WGS with Tb], Ethiopia controlling zoonotic infections, Cameroon reduced response time to cholera, Zika an international strategy
- Challenges: Capacity building long term effort, emergent crisis continue to rise , political nature of work
- Opportunities: Leverage CDC workforce, achieving stable annual funding, engaging in partners

Center of Global Health Update

Rebecca Martin, PhD

Tuberculosis: White House National Action Plan for combating MDR TB (Dec 2015):

1) Strengthen domestic capacity to combat MDR TB,
2) Improve international capacity collaboration to combat MDR TB
3) Accelerate basic & applied R & D to combat MDR TB

Food Safety Modernization Act (FSMA) Surveillance Working Group

Harry Chen, MD

- FSMA working group mandated Nov 2011, charge provide advice & recs to CDC, FDA & HHS on: 1) Improvements of FB illness surveillance, 2) Meet & submit annual report to HHS secretary
- PulseNET Cost Benefit Paper[20th Anniversary]:
  - Annual Maintenance $7.3 M
  - Annual Benefits ~$507M in medical costs and lost productivity due to estimated 270,000 prevented foodborne illness.
- CIDT & WGS: Transforming PulseNET, need plan [next meeting topic] will transform PulseNET internationally
- FY 2017 Expand WGS capacity to rapidly screen bacterial foodborne OB in all states
- NARMS monitoring for Enteric Bacteria
- Need on-farm data to assess use of Abx in food animals and measure effects of changes in food animal Abx use regulations
- CoE (6 Geographical Regions): Surveillance, analyze, train, educate, improve capacity , evaluate and communicate best practices

OID Planning for the Future

Rima Khabbaz, MD

- CDC's framework for fighting disease has three elements: 1) Strengthen PH fundamentals 2) ID & implement PH interventions 3) Develop & advance policy to prevent, detect, and control infections
- Issues of Concern: AR, chronic Hep, food safety, HAI, HIV/AIDS, resp inf, safe water, vaccine preventable diseases and zoonotic & vector borne diseases
- AMD: 5 yrs ago recognized need to catch-up with technology, major strides with AMD, changing thinking and practice
- AMR: CARB call to action, need to change thinking
- Modeling: ID, track & predict disease
- Opportunity for economic modeling

Thank You

Questions?