Ebola and Beyond

Protecting Americans and the World from Disease Threats

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CDC saves lives, protects people, and saves money through prevention

- Work 24/7 to prepare for, find, and respond to infectious diseases, environmental hazards, injuries, and other health threats and emergencies
- Analyze health information and investigate health threats to protect people in the US and worldwide
- Promote proven methods to prevent disease, improve health, and reduce health costs

CDC protects Americans from threats from this country and around the world

CDC operates ~150 labs with ~2,500 scientists and other lab staff

Infectious diseases (reference, diagnosis, research)

Environmental health (genetics, nutrition, chemicals, toxins)

Preparedness and response (bioterrorism, outbreaks, disasters)

Occupational safety and health (workplace safety)

Lab standards and science (quality & regulatory compliance)

Global health (HIV, malaria, TB, emerging diseases)

CDC partnerships around the world

Staff of 1,600+ located in 60+ countries
Global budget of >$1.7 Billion

As of January 2014

We protect America during emergencies

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
World Trade Center Attacks; Anthrax Attacks	West Nile Virus	Columbia Space Shuttle Disaster; SARS; Monkey Pox; Northeast Blackout; Hurricane Isabel; Domestic Influenza; California Wildfires; Ricin; Tularemia; Anthrax; BSE (Mad Cow Disease)	Avian Influenza; Influenza Vaccine Shortage; Guam Typhoon; Ricin Domestic Response; G8 Summit; Summer Olympics; Democratic National Convention; Republican National Convention; Hurricanes Charley, Frances, Ivan, and Jeanne; Tsunami	Marburg Virus; Hurricanes Katrina, Rita and Wilma	Tropical Storm Ernesto; Mumps; E. Coli; E. Coli Spinach/ Botulism Carrot Juice; Rhode Island Mycoplasma	XDR/MDR TB; Hurricane Dean	Satellite Intercept; Salmonella and E. Coli Outbreaks; Hurricane Dolly; Tropical Storm Edouard; Hurricanes Gustav, Hanna, and Ike	Salmonella typhimurium Outbreak; H1N1 Influenza	NH Anthrax; Haiti Earthquake; Deepwater Horizon Oil Spill; Haiti Cholera Outbreak	Japan Earthquake and Tsunami; Polio Eradication Response; Hurricane Irene	Polio; Meningitis Outbreak; Hurricane Sandy	H7N9; MERS-CoV

24/7 outbreak response

Lifesaving vaccines, medicines, and supplies

Emergency Operations

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Global Health Security

3 Risks

- Emerging organisms
- Drug resistance
- Intentional creation

3 Opportunities

- Public health framework
- New lab and surveillance tools
- Successful outbreak control

3 Priorities

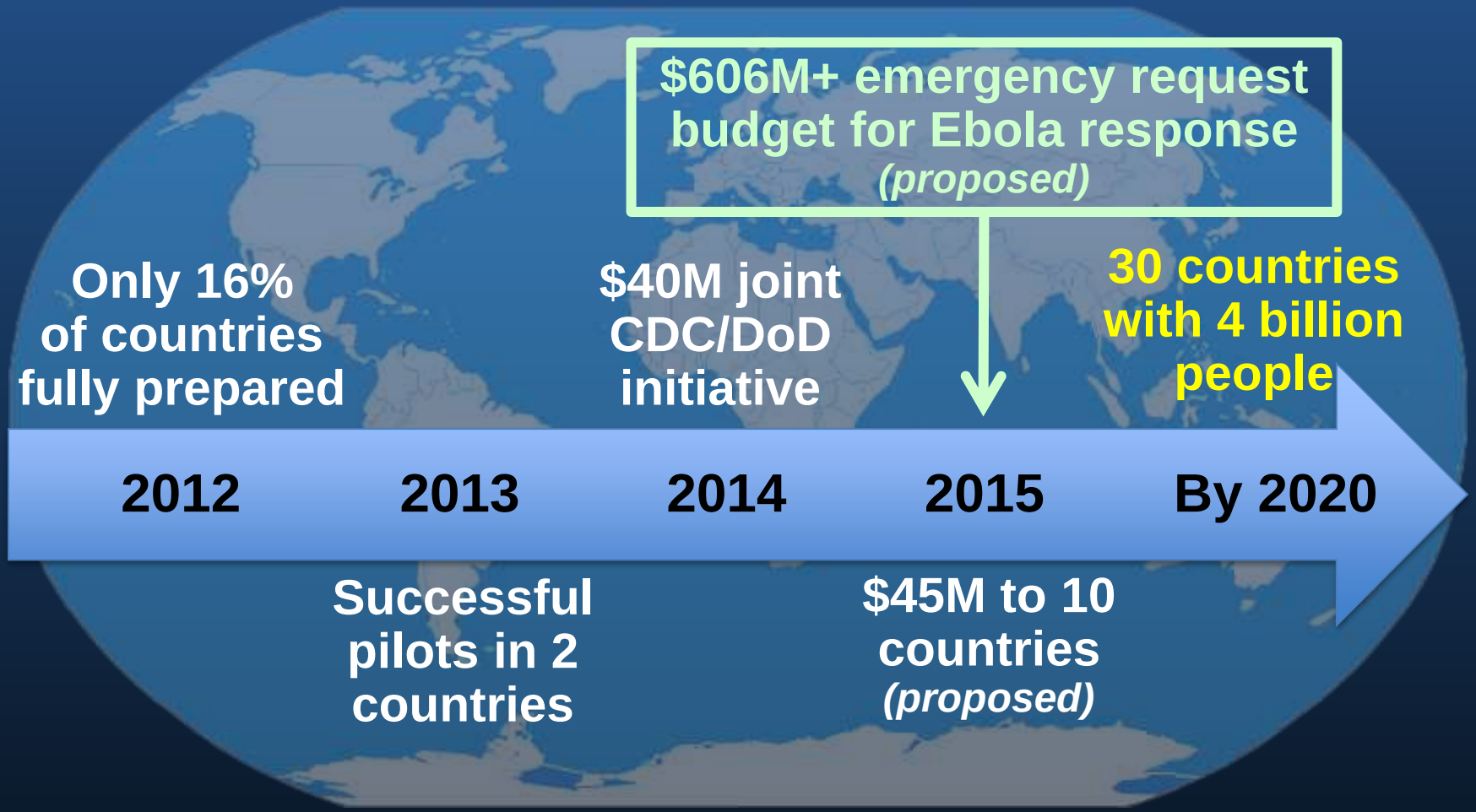
- Prevent wherever possible
- Detect rapidly
- Respond effectively

A health threat anywhere is a health threat everywhere

Global aviation network

Source: The Lancet 380:9857, 1-7 Dec 2012, pp. 1946-55.
www.sciencedirect.com/science/article/pii/S0140673612611519
Note: Air traffic to most places in Africa, regions of South America, and parts of central Asia is low. If travel increases in these regions, additional introductions of vector-borne pathogens are probable

Global Health Security Agenda timeline
US government and partners
Making the world safer for 4 billion people



A safer US and a safer world

US CDC works directly with countries to

Prevent avoidable catastrophes

- Biosafety & biosecurity
- Immunization
- Surveillance of zoonotic disease in humans
- Antimicrobial resistance

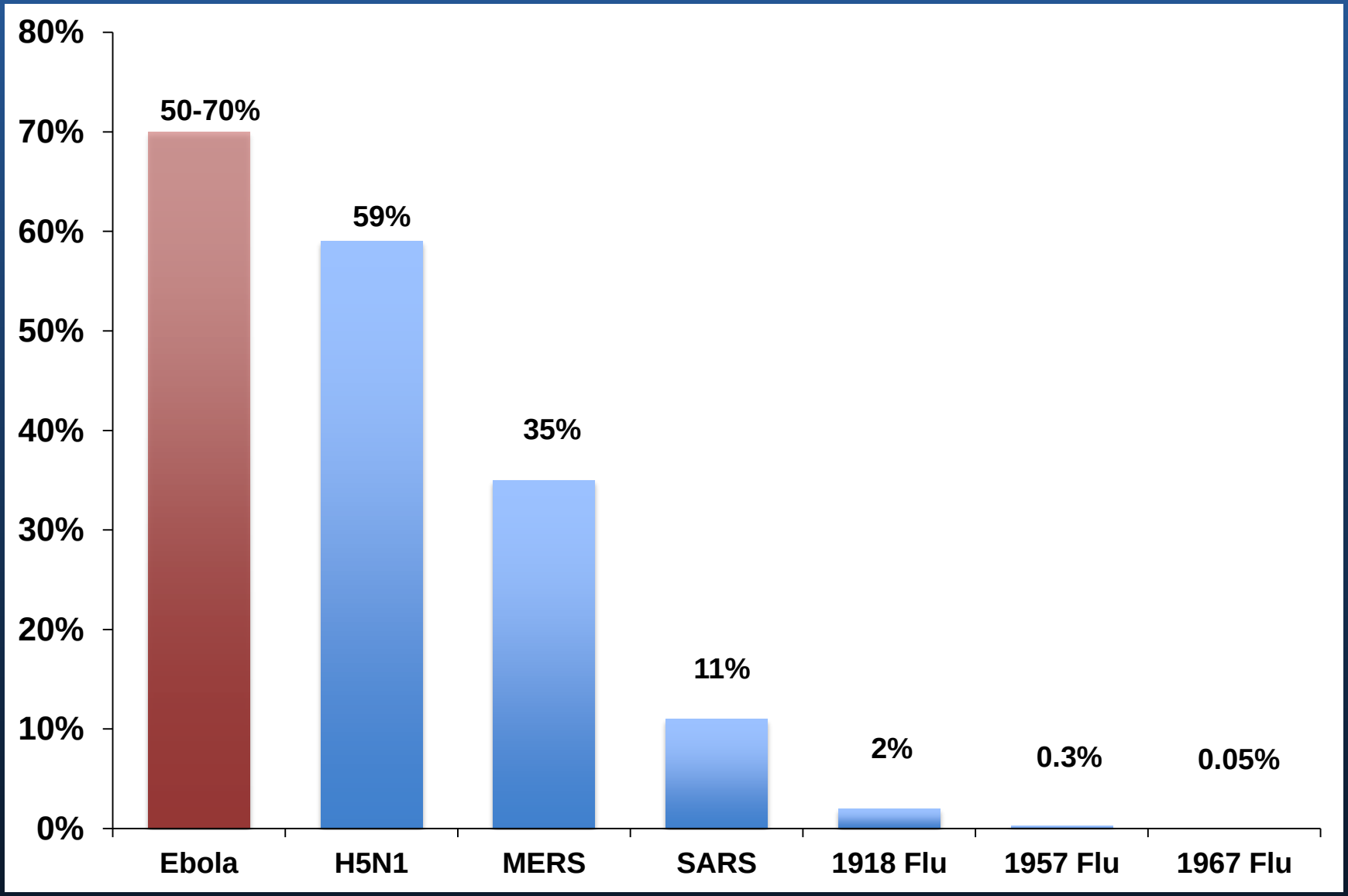
Detect threats early

- Surveillance
- Laboratory
- Information systems
- Disease detectives and other public health staff

Respond rapidly and effectively

- Emergency Operations Centers
- Medical countermeasures
- Linking public health and law enforcement

Case fatality rates



Ebola: bottom line up front

1. Despite recent progress, the epidemic is severe
2. Core public health interventions can stop it
3. Success requires speed and scale deploying effective prevention and control measures

Overarching principles for response

- **Speed is paramount**
- **Flexibility**
- **Front lines first**

Firefighting in 3 zones

FIVE COMPONENTS OF EFFECTIVE EBOLA RESPONSE

Incident management

Effective incident management/EOC functioning in the 3 countries and every district within them

Treatment

Expand isolation and treatment capacity

Burial support

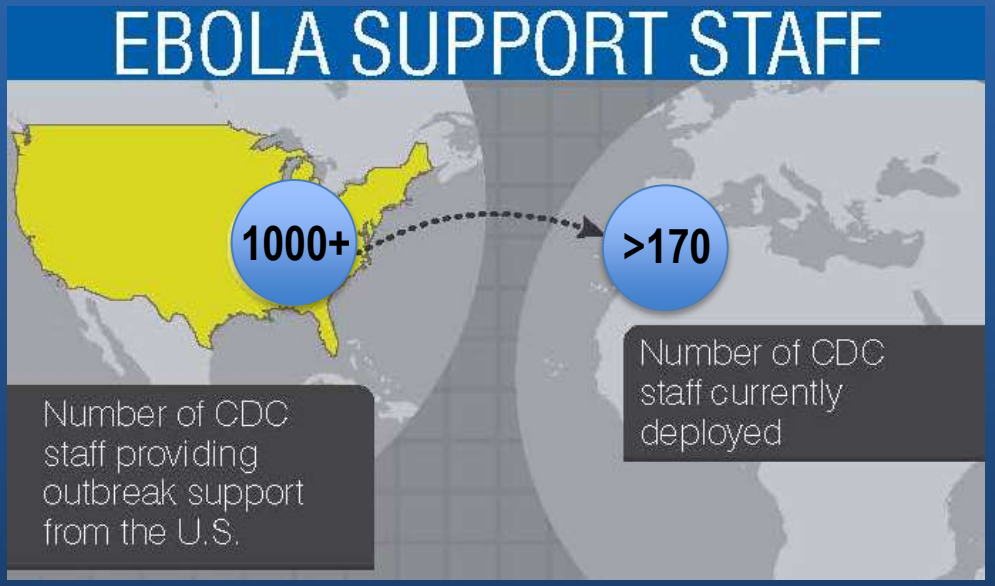
Rapidly ensure safe burial

Infection control in all health care systems

Training, supplies, and public health monitoring

Communications

Communicate clearly, simply, and frankly at all levels to change behaviors



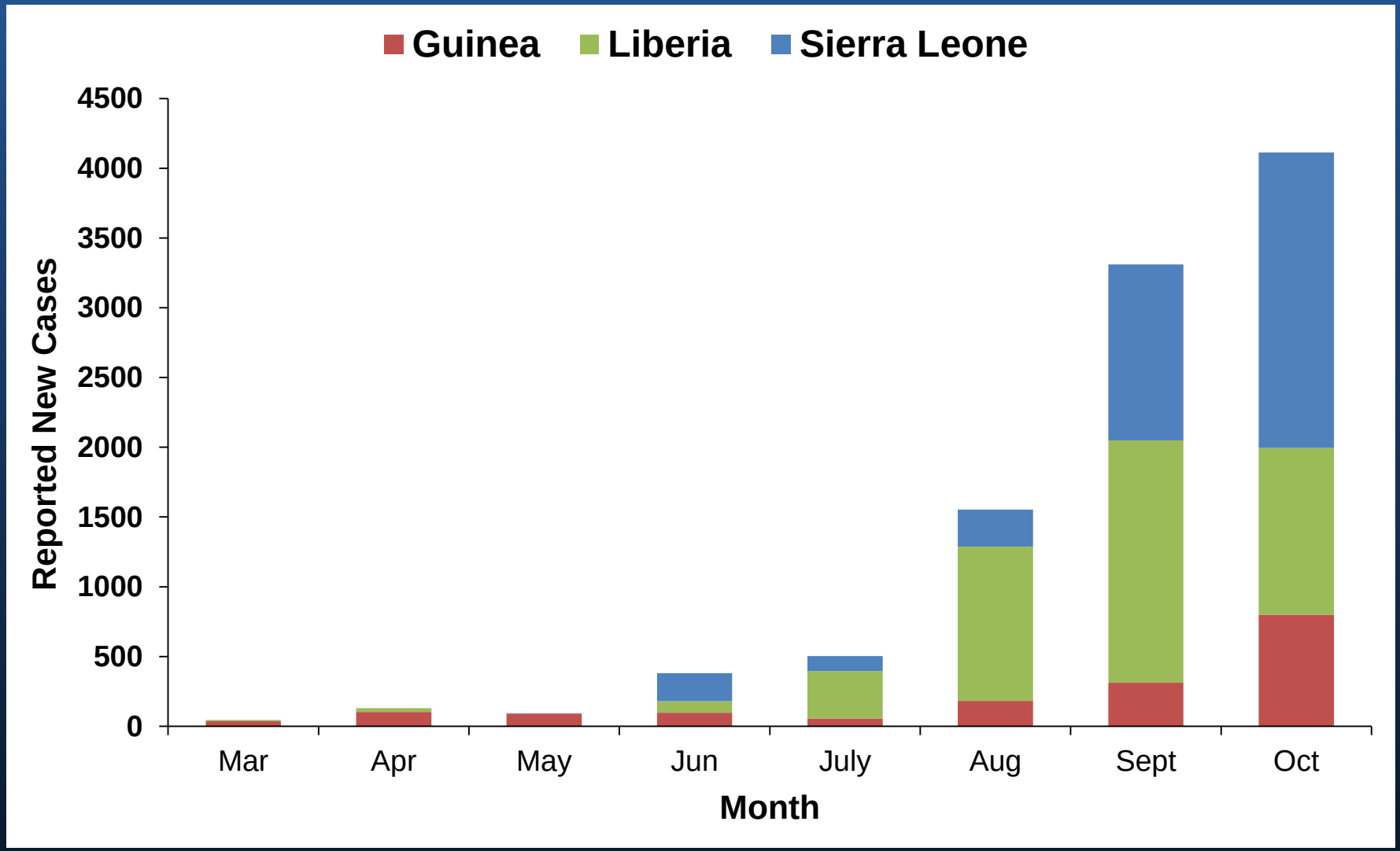
>170 CDC staff deployed

- Most in Guinea, Liberia, Sierra Leone
- Some in Nigeria, Senegal, Mali, and other countries
- Epidemiologists, exit screeners, health communicators, lab technicians, logistics/support, etc.

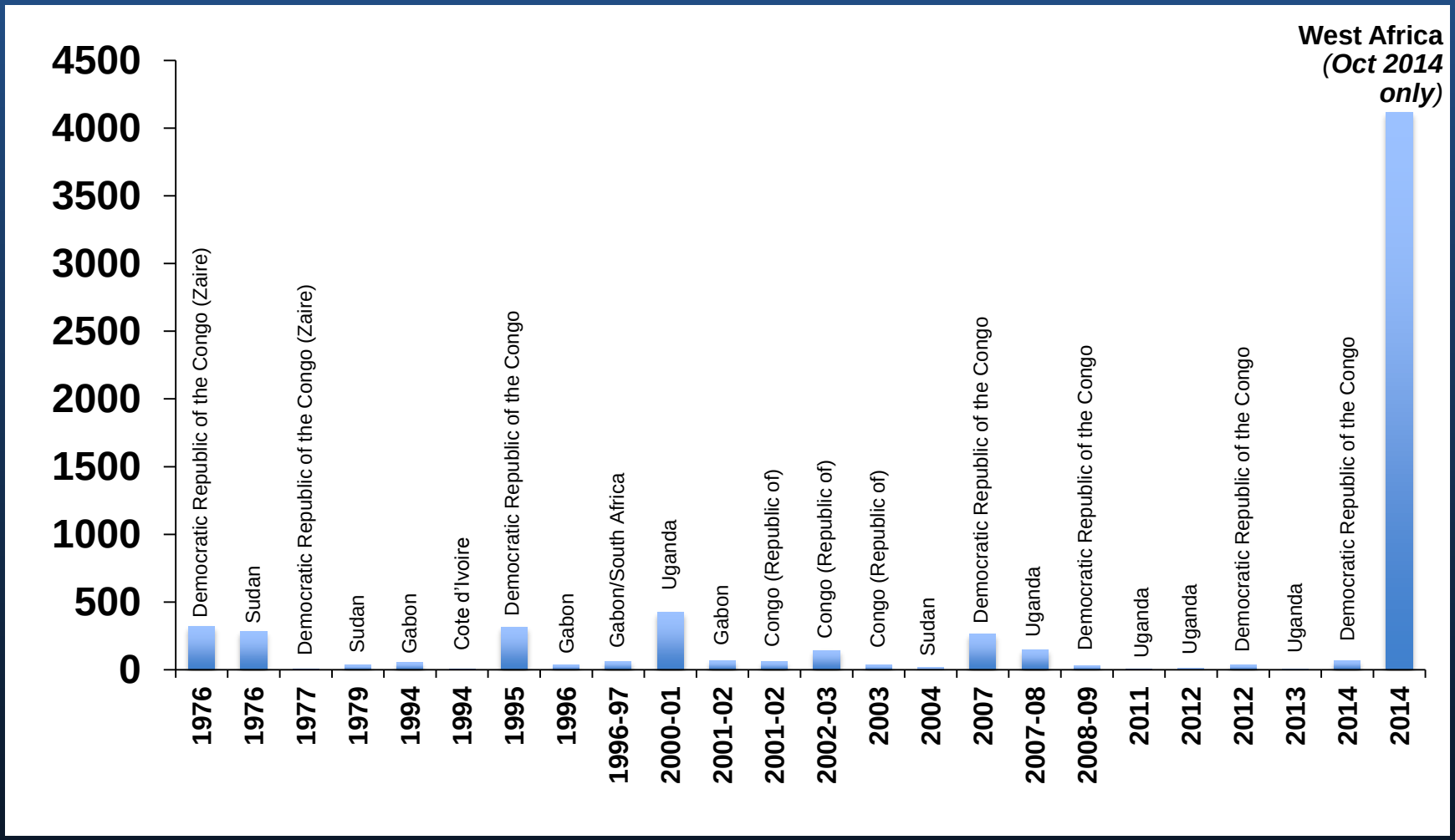
CDC's response to Ebola – global

- Stopping Ebola at the source is the only way to eliminate risk for Americans
- Largest global response in CDC history
  - >160 staff deployed in West Africa, 1,000+ total
- CDC has the skills and expertise needed to
  - Detect and respond to outbreaks
  - Prevent and control diseases
  - Address emerging threats to our health
- International efforts support USG & global partners
  - Extensive on-the-ground support in Liberia, Sierra Leone, Guinea
  - Also in Nigeria, Senegal, Mali and other countries

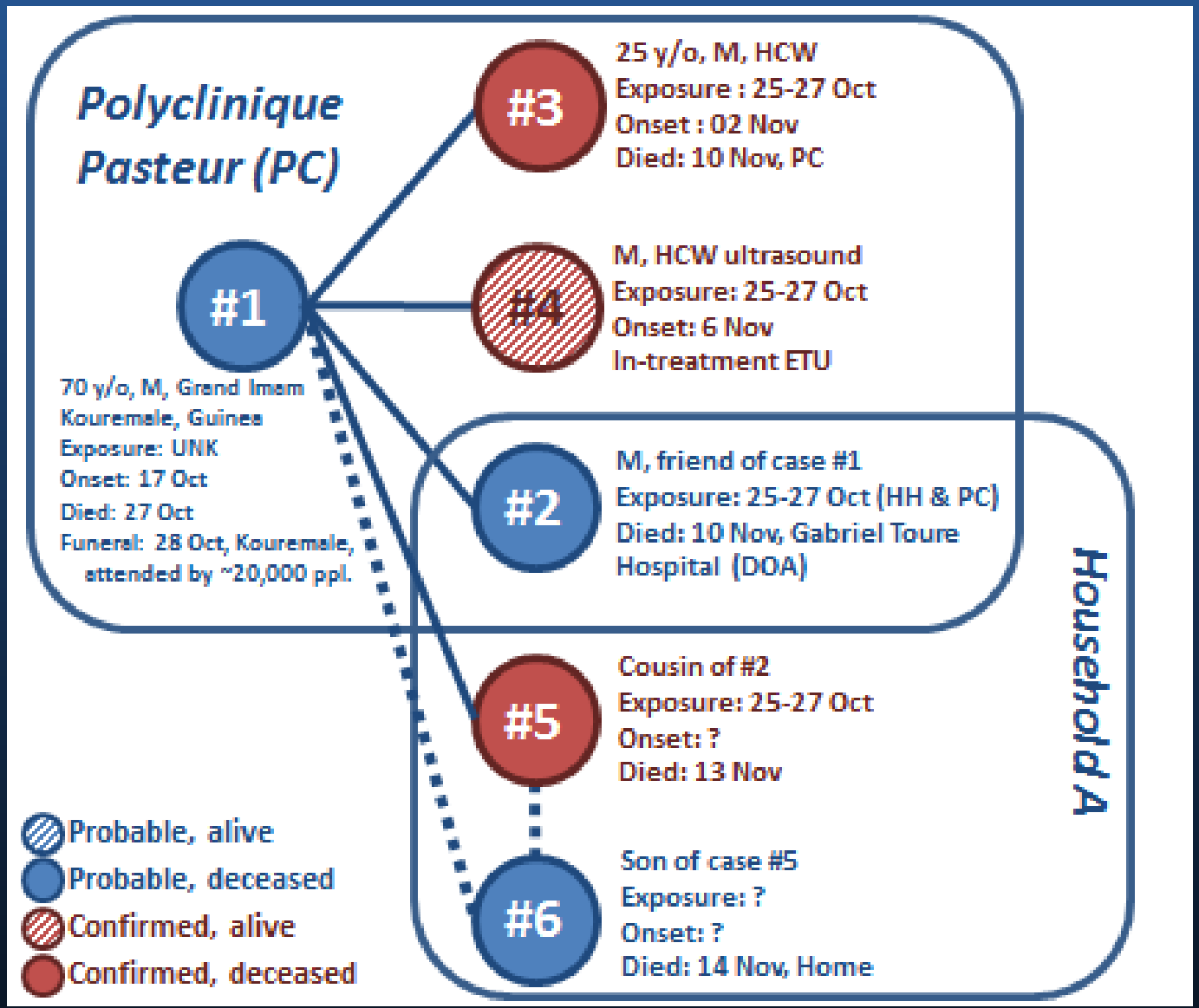
Ebola cases continue to increase in West Africa



Ebola cases in West Africa in October alone exceeded all other recorded Ebola outbreaks combined



Mali Ebola virus transmission



Mali Ebola investigation
as of 13 November

Mali

- 8 contact tracing cohorts *(1 Kouremale, 7 Bamako)*
- At least 256 contacts identified

Guinea

- 3 contact tracing cohorts *(1 Kouremale 1 Siguiri 1 Gueckedou)*
- 110 current contacts identified

Border Health Measures

Key components of Global Health Security

Sierra Leone

Nigeria

Guinea

Liberia

Preparedness status of priority countries

(Updated 11/4/2014)

	Benin	Burkina Faso	Cameroon	Cote d'Ivoire	Gambia	Ghana	Guinea-Bissau	Mali	Mauri-tania	Niger	Nigeria	Senegal	Togo
VHF surveillance capacity													
Infection control in general health care system													
Diagnostic laboratory capacity													
Border and travel related measures													
Health protection awareness													
Government emergency response management													
Participated – USAID workshop	Yes	Yes	Ongoing	Yes	Yes	going		Yes		Yes		Planned	Yes
CDC Country Office	Yes**											Yes**	

Only listing here 6 of 13 indicators from CDC checklist of "critical elements."

- **Responses received from Benin, Cameroon, Cote d'Ivoire, Guinea-Bissau and Nigeria**
- **The remaining table based on CDC International Task Force assessments**

**President's Malaria Initiative Assignee only

Available	Somewhat available	Not available	Not yet assessed

Ebola survivor returns to her community after being discharged from the Firestone Ebola Treatment Unit

CDC's response to Ebola – domestic

- Screening and monitoring of travelers
  - Exit screening in affected countries
  - Entry screening in the US
  - Active monitoring of all returning travelers, including CARE kits, 24/7 hotline, quarantine if needed, and safe transport and care in case of illness
- Health care system support
  - Infection control
  - Laboratory networks
  - Technical assistance

Health care preparedness

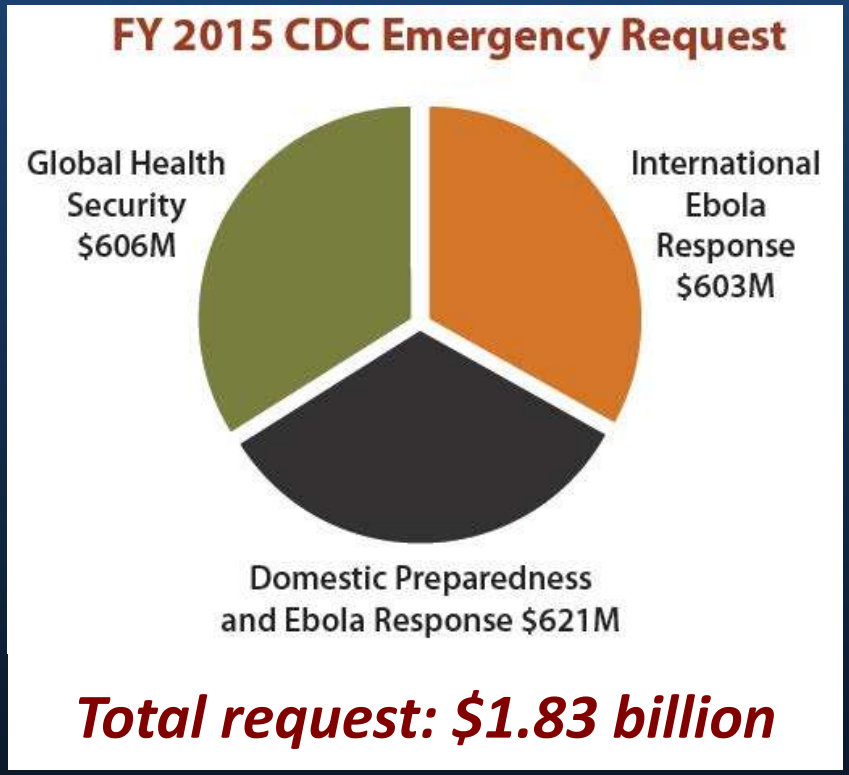
- Deploy Rapid Ebola Preparedness (REP) teams
  - Deploy to any hospital with a lab-confirmed case
  - Rapidly manage patient safely and effectively
  - Handle triage and clinical management
  - Help identify hospitals best suited to care for patients
  - Help hospitals assess and develop comprehensive Ebola-specific infection control plans
  - Provide technical assistance and guidance
- Initial REP team deployment
  - Near airports with enhanced entry screening (JFK, Newark, Dulles, O'Hare, Hartsfield-Jackson)
  - Where active public health response efforts involve large numbers of contacts of cases (e.g., Texas, Ohio)
  - Areas with high concentrations of travelers returning from Sierra Leone, Guinea, or Liberia

FY 2015 emergency budget request: *$1.83 billion to fight Ebola on all fronts (included in $6.2 billion total USG request)*

CDC's ongoing, increasingly intensive domestic & international response shows that substantial additional investments must be made

Goals

- Stop Ebola epidemic at its source
- Support immediate and decisive response to any domestic case
- Prepare for and respond to disease threats around the world – prevent the next Ebola or other emerging health threat



	Global Health Security	Stopping the Ebola Epidemic
PREVENT	Promote bio-safety	Infection control training and supplies for health care facilities
	Reduce outbreaks	Safe burial
	Minimize zoonotic diseases impact on human populations	Reduce contact with bats and unsafe handling of bush meat
DETECT	Disease surveillance	Improve disease & syndrome reporting
	Lab testing	Diagnostics and specimen transport
	Trained workforce	Staff to find/trace contacts & manage outbreak detection/response (e.g., Field Epidemiology Training Programs; paid, supervised, & supported health/public health staff)
RESPOND	Emergency Operations Centers	Emergency Operations Centers in each country and each area within the country experiencing Ebola outbreak
	Receive & deploy countermeasures	Isolation units with trained staff & uninterrupted supply of personal protective equipment & other supplies

Advanced Molecular Detection

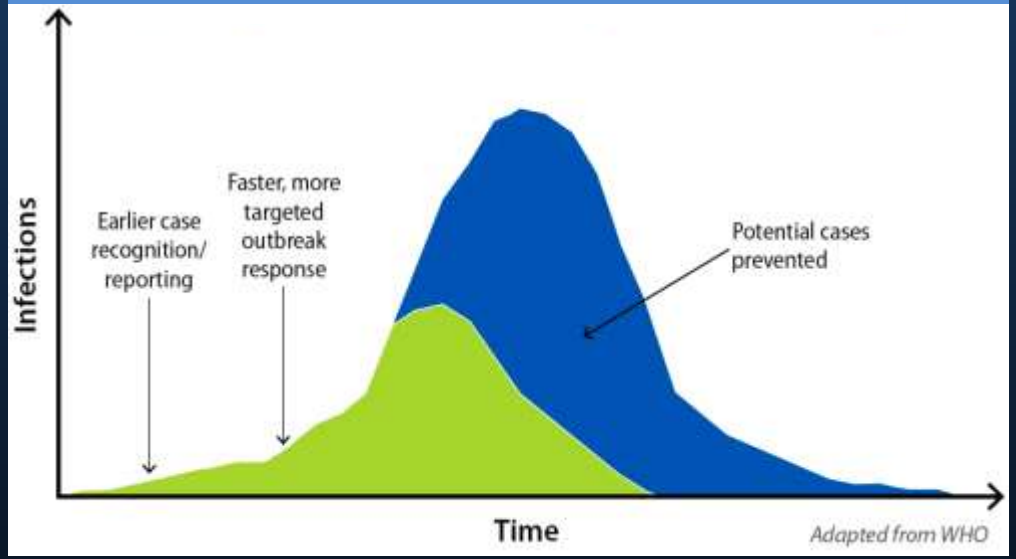
Enhancing CDC's capabilities to find and stop infectious disease outbreaks

Advanced Molecular Detection saves lives, time, and money

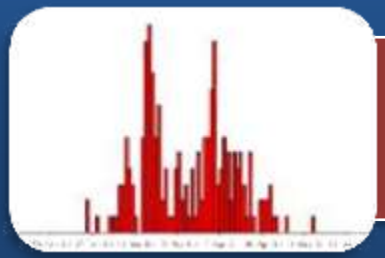
- AMD includes new lab technologies that revolutionize how CDC investigates and controls outbreaks
- Enables CDC to detect outbreaks sooner & respond more effectively – saving lives, time, and money

Detects pathogens in just *hours* or *days*

Improving public health through AMD technologies



Advanced Molecular Detection combines cutting-edge approaches



Traditional epidemiology

+

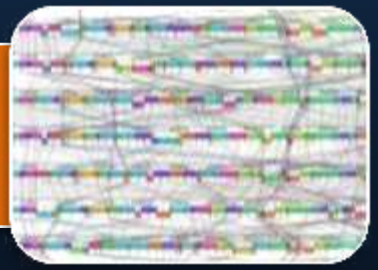
Genomic sequencing

+

Bioinformatics

=

Advanced Molecular Detection



Advanced Molecular Detection

5-year initiative to enhance CDC's microbiology & bioinformatics capabilities to find and stop infectious disease outbreaks

1. Improve pathogen identification & detection
2. Adapt new diagnostics to meet evolving public health needs
3. Help states meet future reference testing needs in coordinated manner
4. Implement enhanced, sustainable, and integrated laboratory information systems
5. Develop prediction, modeling, and early recognition tools

$30M provided in FY 14; $30M requested in FY 15; $150M total planned over 5 years

Advanced Molecular Detection will allow CDC to detect outbreaks sooner, respond more effectively, saving lives and reducing cost

IMPROVED DETECTION

Enhanced recognition of emerging microbial threats and antimicrobial resistance

Better targeting of proven prevention strategies and development of new ones

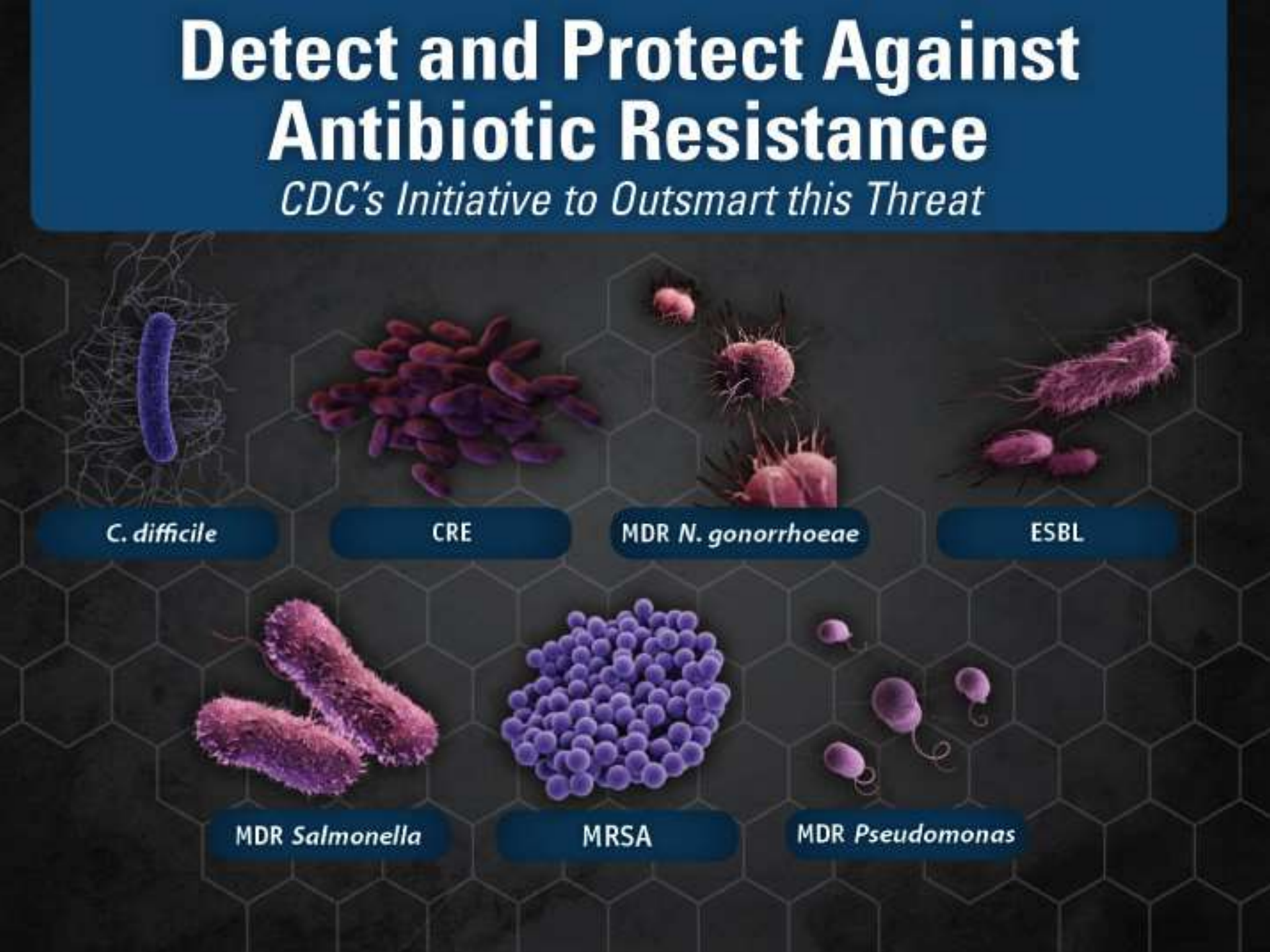
IMPROVED SURVEILLANCE

Improved surveillance information on the transmission of infections and the extent and spread of outbreaks

Faster, more effective control efforts

Detect and Protect Against Antibiotic Resistance

CDC's Initiative to Outsmart this Threat



Estimated minimum number of illnesses and deaths caused annually by antibiotic resistance*:

At least

2,049,442 illnesses

23,000 deaths

**bacteria and fungus included in this report*

Modern medicine is at risk

- Loss of effective antibiotic treatment could make routine infections deadly
  - Pneumonia
  - Urinary tract infections
  - Wound infections
- Patients who receive specialized care will be at highest risk
  - Cancer chemotherapy
  - Complex surgery
  - Joint replacements
  - Organ transplants
  - Chronic conditions (e.g., rheumatoid arthritis)
  - Dialysis

Cancer treatments are at risk

>600,000

>600,000 patients will receive chemotherapy in 2014*

~60,000

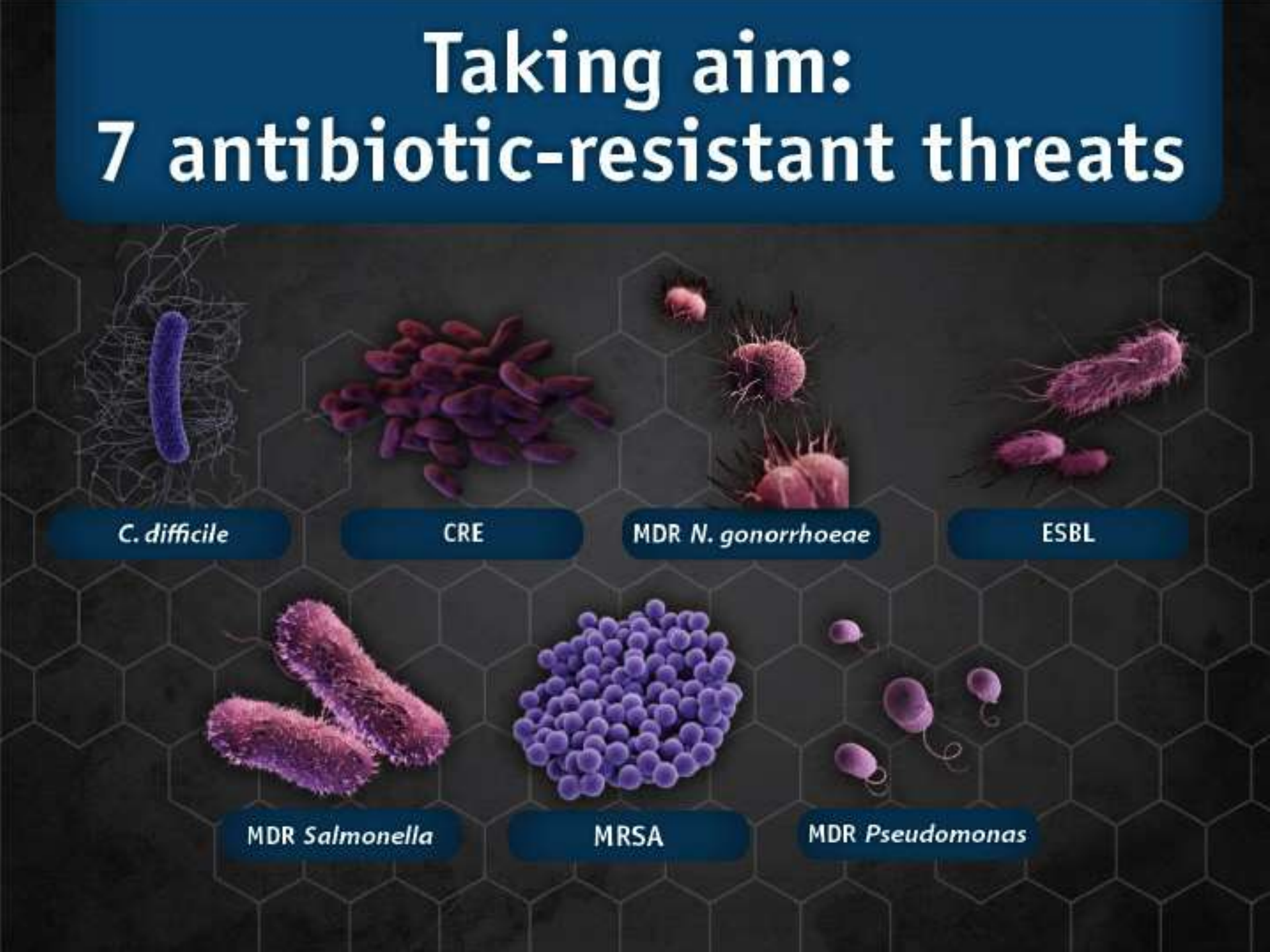
~60,000 cancer patients will be hospitalized with neutropenia and infections†

1 in 14

1 in 14 of these will die from this complication†

** Kantar Health. Cancer impact.*
† Projections from Cagigano et al., Cancer, 2005.

Taking aim: 7 antibiotic-resistant threats



Detect and protect against antimicrobial resistance

Detect

Track AR in real time; uncover outbreaks quickly; identify new, emerging resistant organisms

Respond

Stop outbreaks early

Prevent

Prevent spread of resistant organisms & emergence of new resistance; scale up proven interventions; preserve effectiveness of current antibiotic treatments

Innovate

Design new interventions

Detect and Protect – FY15 proposal

A down payment to improve our country's ability to start tackling our biggest drug-resistant threats

The FY 2015 President's Budget requests $30 million/year for 5 years to:

Speed-up outbreak detection through regional labs and support development of new antibiotics and diagnostics

Improve infection prevention and antibiotic prescribing

AR Initiative begins to address gaps in knowledge of antibiotic resistance

Enhances state/federal capacity to detect and respond to emerging antibiotic resistance threats

Resistant-bacteria bank makes available isolates to pharmaceutical, biotech, and diagnostic companies to speed development of new antibiotics and diagnostics

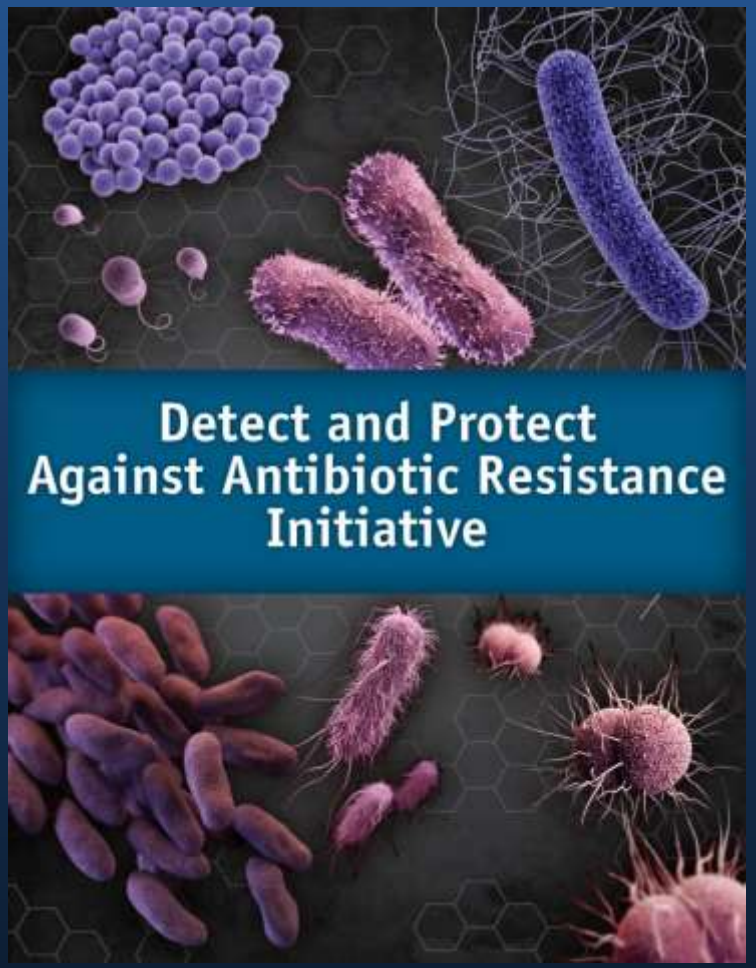
Public data portal shows national trends and variations among states in prescribing and resistance

Scale up interventions to improve antibiotic prescribing

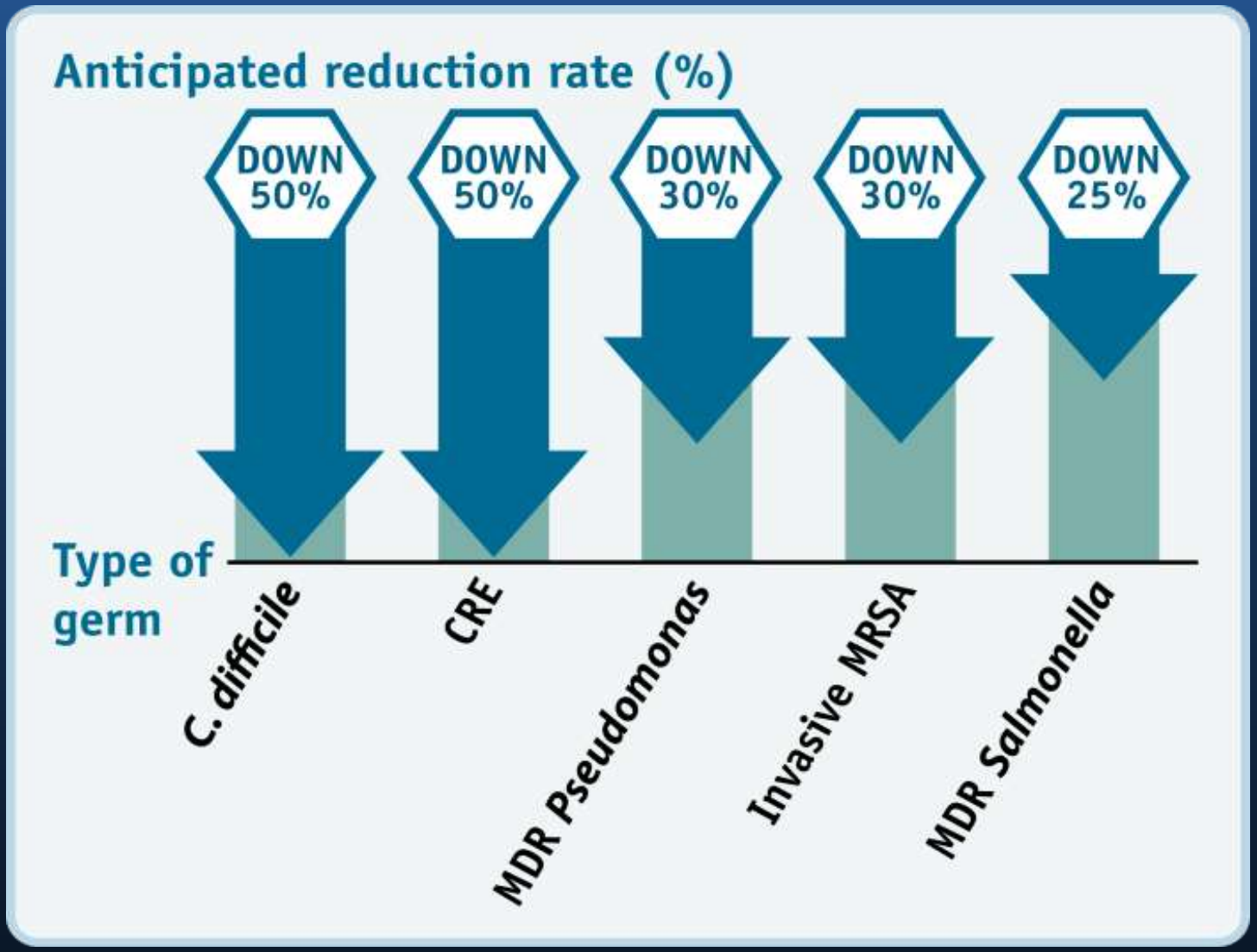
Understand the effect antibiotics given to children have on their future health problems

AR Initiative: key activities

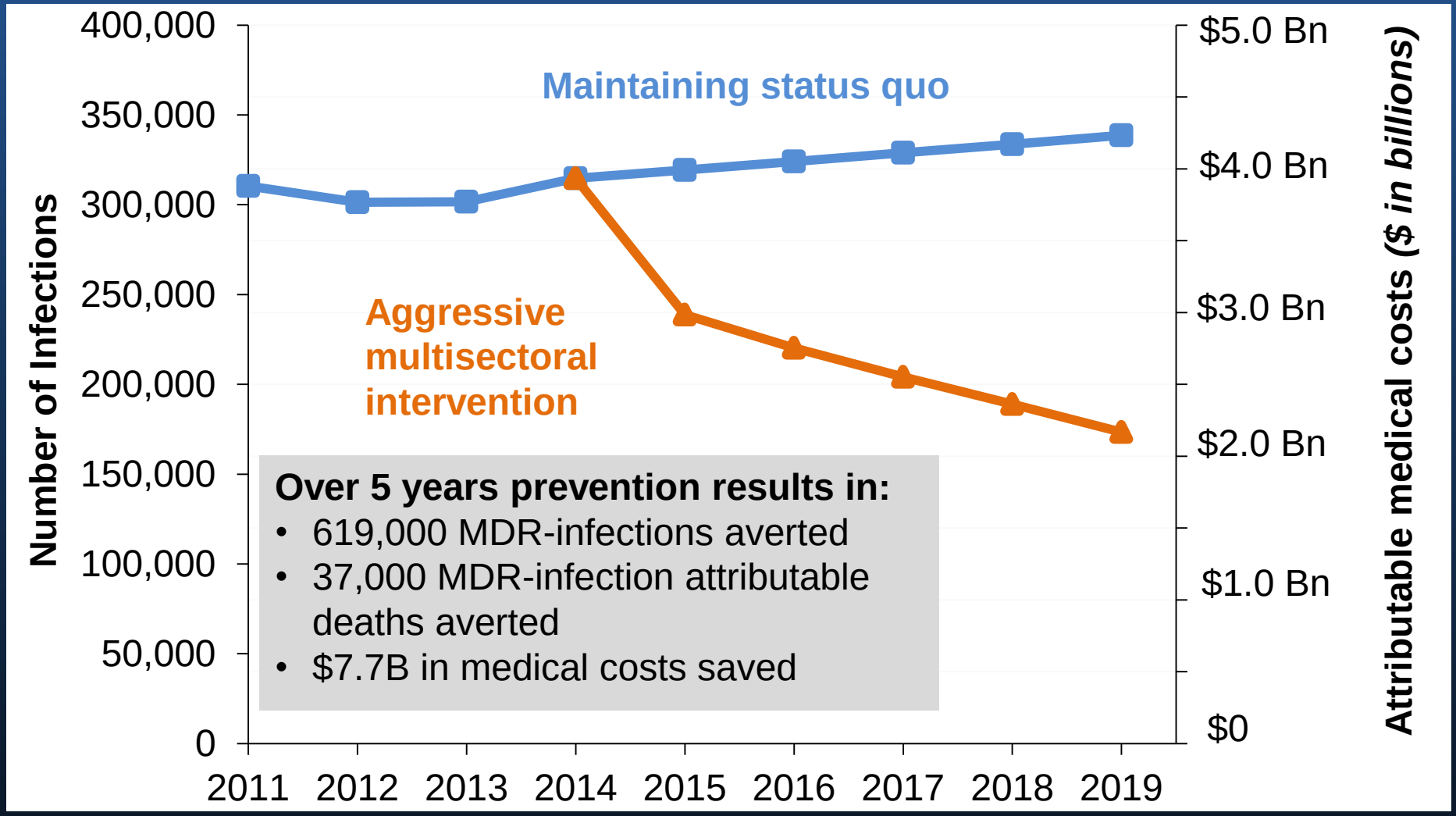
- New AR regional lab network
- New resistant-bacteria bank (AR Isolate Library)
- Prevent infections and improve antibiotic prescribing in health care facilities
- Target community threats
- Improve antibiotic prescribing in the community



AR Initiative could achieve reductions in many infections



Projected burden of healthcare-associated invasive MRSA, healthcare-associated CDI, healthcare-associated CRE, and hospital-onset MDR *Pseudomonas* infections



Antibiotic stewardship program key elements

- Commitment
- Single leader
- Tracking
- Clinician education
- Reporting
- Implementation

Antibiotic stewardship is an effective strategy to prevent AMR

Facility benefits	Antibiotic best practices	Antibiotic stewardship programs are a "win-win"
• Decrease antibiotic resistance • Decrease *C. difficile* infections • Decrease costs • Improve patient outcomes	• Ensure all orders have dose, duration, and indications • Get cultures before starting antibiotics • Take an "antibiotic timeout," reassessing antibiotics after 48-72 hours	• A University of Maryland study showed one antibiotic stewardship program saved $17M over 8 years • Antibiotic stewardship helps improve patient care and shorten hospital stays

National Healthcare Safety Network

- 12,000 facilities report public data
  - CLABSI, CAUTI, and SSI NHSN data on CMS's Hospital Compare website
  - Adding MRSA and *C. diff* data
- 1,000+ facilities now electronically report at least one event type
  - Work with CMS to offer incentives to electronic reporting
  - Provide vendor portal to improve access to tools and resources needed to integrate with NHSN
- Strengthening collaborations with CMS broadly

Stop the ticking time bomb...

It's a big problem, and one that's getting worse. *But it's not too late.*

We can delay, and even in some cases reverse, the spread of antibiotic resistance.


Data
Policy

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