

Centers for Disease Control and Prevention



CDC – Protecting America and the World

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Director, Centers for Disease Control and Prevention

Kiwanis Club of Atlanta

March 22, 2016

Thank You!



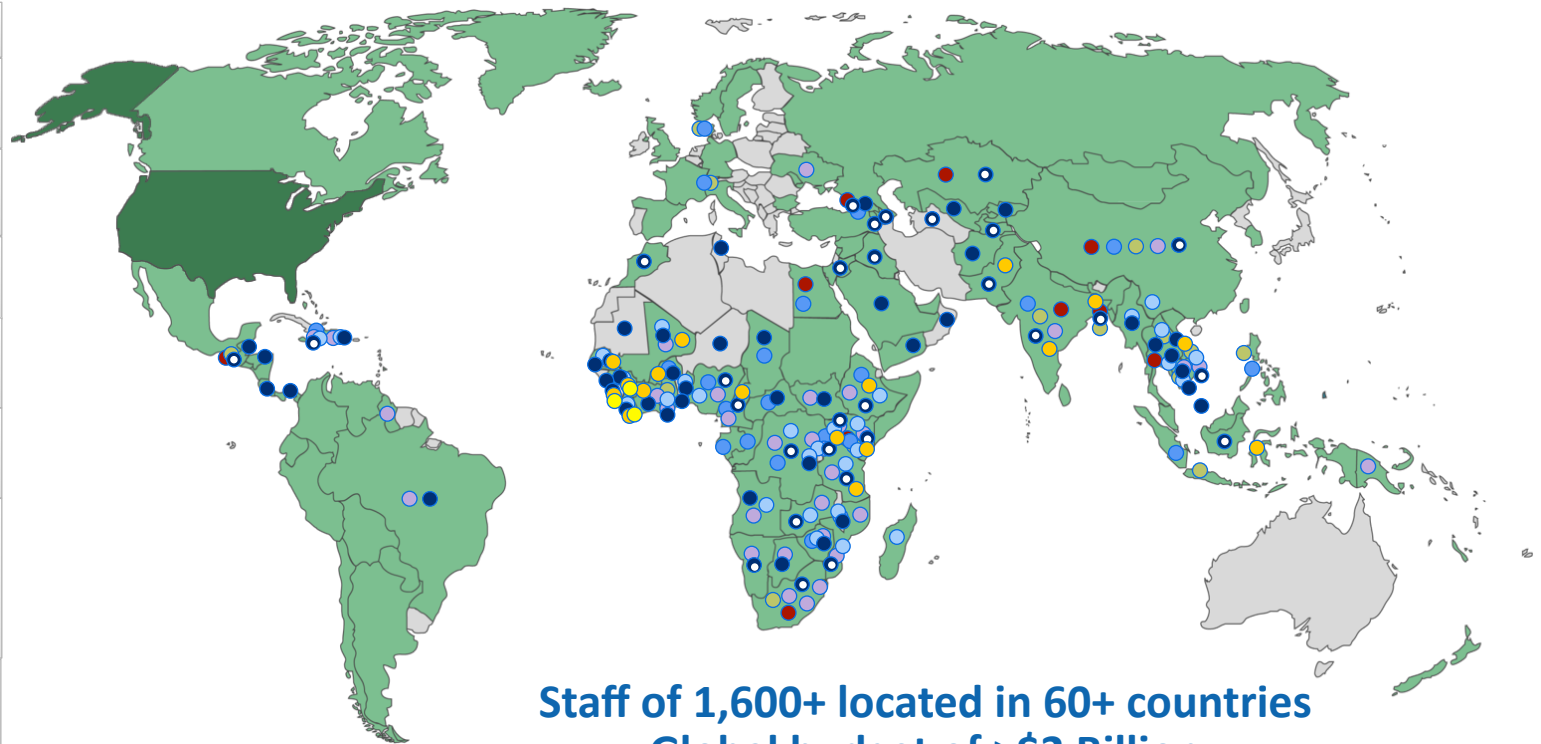
**The world is
safer than ever from
global health threats**

AND

**The world is at
greater risk than ever from
global health threats**

CDC DOCTORS, NURSES, AND DISEASE CONTROL EXPERTS WORK AROUND THE WORLD TO KEEP AMERICANS SAFE

- CDC's global presence
- Global Disease Detection Center
- Global Immunizations – Measles/Polio
- Influenza experts deployed
- Malaria experts deployed
- Global HIV/AIDS Program
- Field Epidemiology Training Program
- CDC epidemiologist in country
- GHSA phase one country
- Ebola-affected country



Staff of 1,600+ located in 60+ countries
Global budget of >\$2 Billion

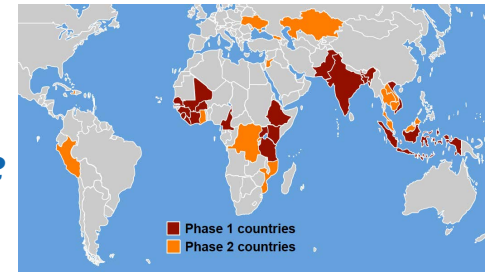
As of August 2015

PROTECTING THE UNITED STATES THROUGH A SAFER AND HEALTHIER WORLD

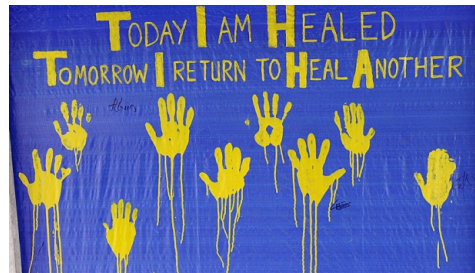
Polio:
World closer to eradication than ever



Global Health Security:
>70 countries, more labs, disease detectives, outbreak control



Ebola:
Widespread transmission in West Africa stopped

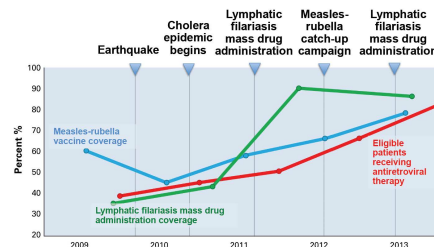


PEPFAR:
Millions of HIV deaths and infections prevented



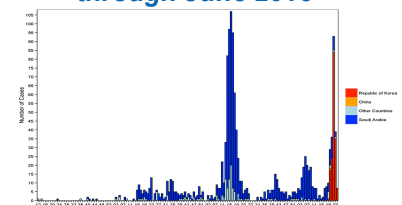
Haiti:
>40,000 lives saved; malaria, filariasis, and infant HIV on road to elimination

Public health progress in Haiti, 2009-2013



MERS:
Support for control around world; rapid detection and no spread in US

MERS – confirmed cases through June 2015



TALES OF TWO OUTBREAKS

SARS

- Delay in detection and reporting
- >\$40 billion economic costs

H7N9

- Prompt detection and reporting
- Global collaboration
- Rapid control

Ebola: West Africa

- Delay in detection and reporting
- Slow response
- Estimated \$15 billion economic costs

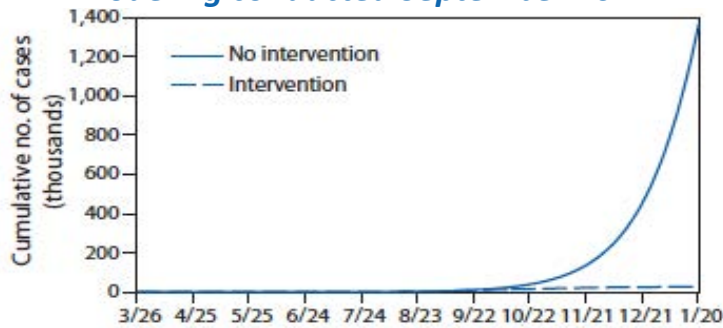
Ebola: Nigeria

- Prompt detection and reporting
- Rapid response and control



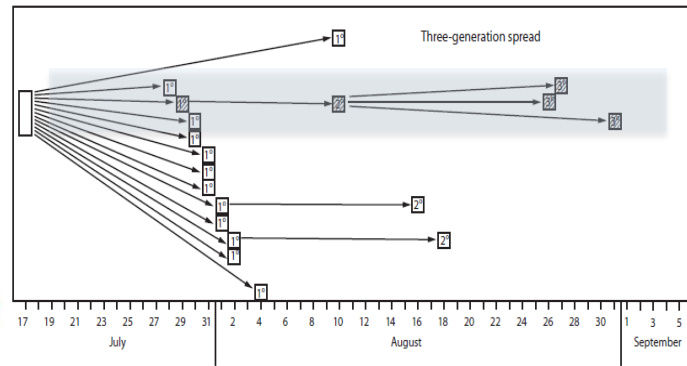
EBOLA: WHAT MIGHT HAVE BEEN

Modeling projected an exponential increase in cases without intervention
 Modeling conducted September 2014



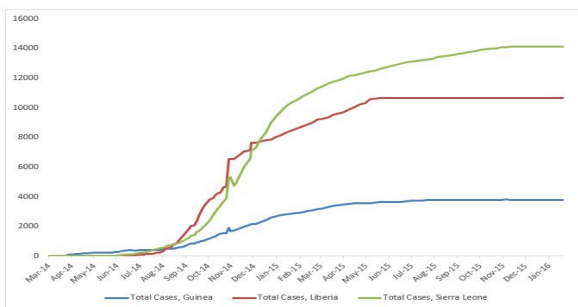
MMWR Surveill Summ 2014;63 Suppl 3:1-14. Corrected for potential underreporting by multiplying reported cases by a factor of 2.5.

Ebola outbreak in Nigeria was stopped quickly



If Ebola had not been stopped in Lagos, it likely would have spread for months or years to many other areas of Nigeria and Africa, killing hundreds of thousands of people and setting back a decade of progress saving lives

Total cases over time, 3 most heavily affected countries



Nigeria	
Contacts identified	894
Home visits of contacts	19,000
Number of cases (from index case)	19

GLOBAL HEALTH SECURITY



3

Risks

- Emerging organisms
- Drug resistance
- Intentional creation



3

Opportunities

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



3

Priorities

© David Snyder/CDC Foundation

- Prevent wherever possible
- Detect rapidly
- Respond effectively

A HEALTH THREAT ANYWHERE IS A HEALTH THREAT EVERYWHERE



Source: Kilpatrick & Randolph. *Lancet* 2012;380:1946-1955.

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.

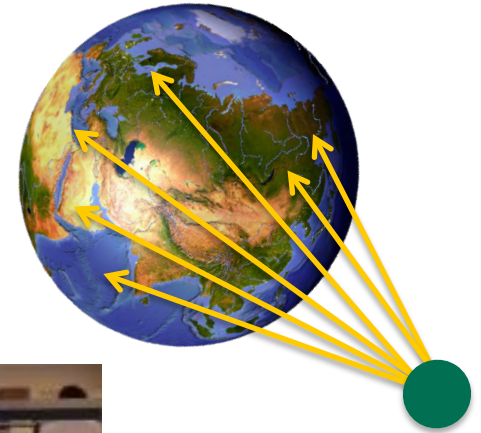
MOST OF THE WORLD IS STILL UNPREPARED
Fewer than 1 in 3 countries self-reported being fully prepared for outbreaks as of 2014



A SAFER WORLD THROUGH GLOBAL HEALTH PROTECTION

Prevent avoidable catastrophes

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



Detect threats early

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



Respond rapidly and effectively

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



NEW STRATEGIES AND TECHNOLOGIES TO FIND AND STOP OUTBREAKS – UGANDA

SAMPLE COLLECTION



SAMPLE TRANSPORT – MOTORCYCLE COURIER AND OVERNIGHT MAIL




CENTRALIZED LAB TESTING




**EMERGENCY OPERATIONS CENTER
OUTBREAK CONTROL**



PATIENT CARE



**LAB RESULTS SENT ELECTRONICALLY,
PRINTED INSTANTLY IN FIELD**



FIGHTING CHOLERA IN TANZANIA

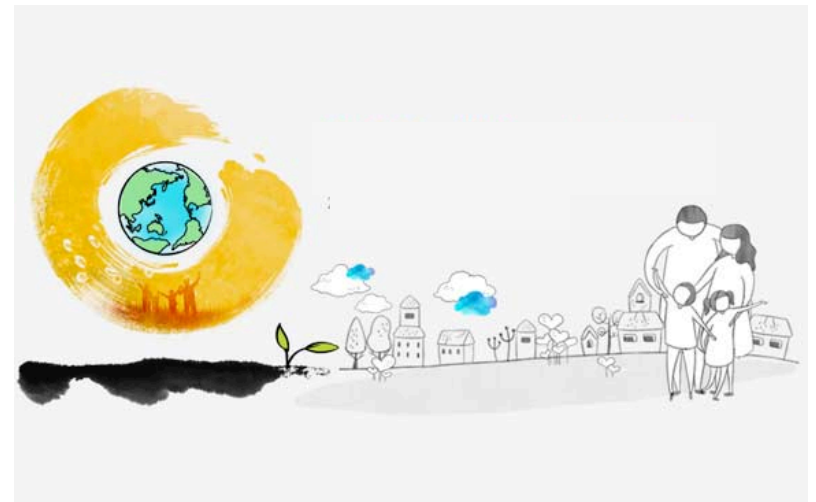
- Tanzania has experienced countrywide cholera outbreak since summer 2015
 - Nearly 10,000 cases
- Response implements GHSA principles
 - Rapid detection – laboratory capacity & surveillance strengthened
 - Robust response – FELTP support, EOC established
 - Prevention measures – medical countermeasures, WASH interventions



A Tanzanian FELTP resident speaks with a group of villagers about cholera in response to the outbreak

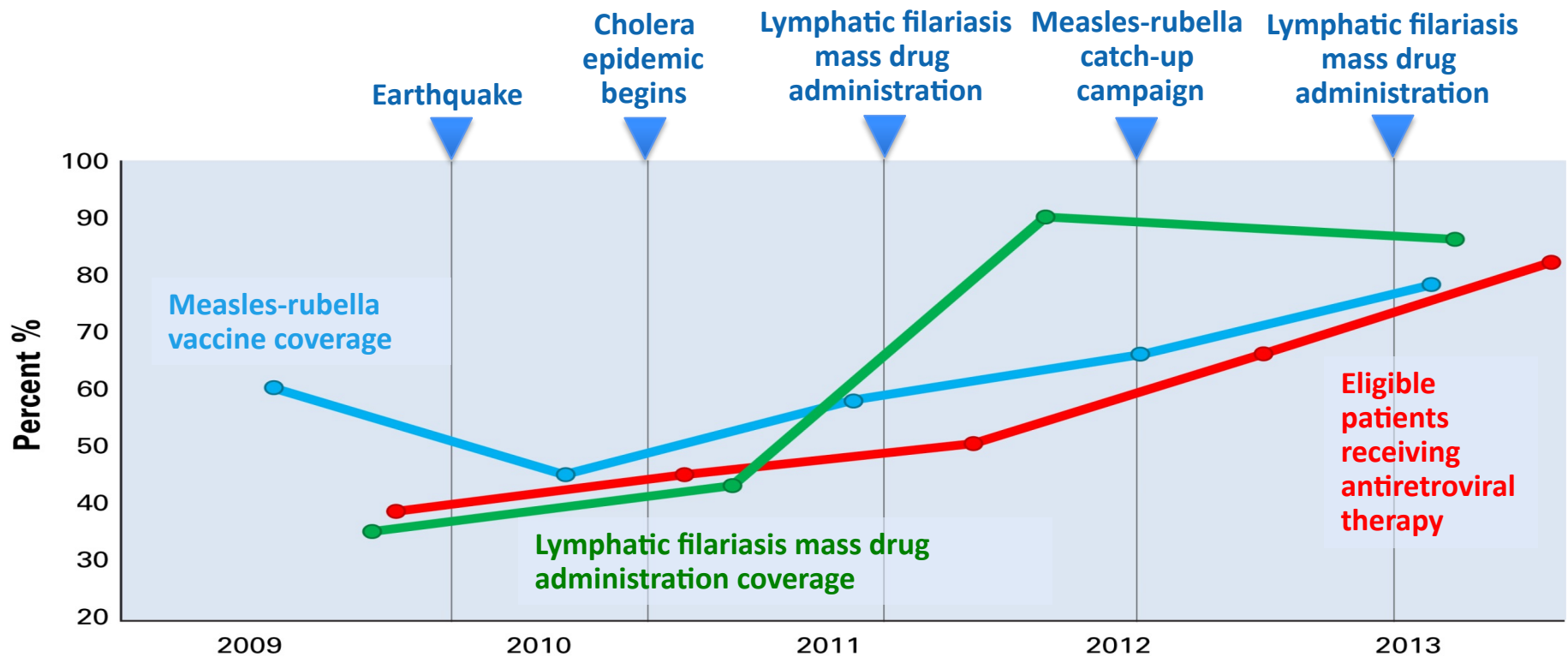
HEALTH SECURITY PROTECTS MORE THAN HEALTH

- Health security is a national security issue
- Protection from diseases before they reach our borders
- Promotes economic and political stability
- Promotes US economic interests
- Soft power – best diplomacy tool
- The US has the resources and expertise to save lives – the right thing to do



GLOBAL HEALTH SECURITY INVOLVES MORE THAN EMERGENCY RESPONSE

Public health progress in Haiti, 2009-2013



ADDITIONAL BENEFITS FROM STRENGTHENING GLOBAL HEALTH SECURITY

- Protect poorest countries and most neglected people; health and economic benefits
- Strengthen country capacity to focus and implement health programs more effectively
- Create sustainable systems to increase vaccination coverage and address antimicrobial resistance
- Strengthen country organizations' capacity and resilience to address any health threat
- Strengthen all segments of society by taking a holistic approach to health and security



**Global Health
Security Agenda**



ADDRESSING EMERGING THREATS: ZIKA VIRUS

- Zika virus transmitted by same mosquito that spreads dengue and chikungunya viruses
- Strong indications of
 - Association with microcephaly and possibly other poor pregnancy outcomes in some babies of mothers infected with Zika virus while pregnant
 - Association with Guillain-Barré syndrome
- CDC travel guidance for pregnant women issued within days of strong evidence of association between Zika and microcephaly



Zika Virus Spreads to New Areas – Region of the Americas, May 2015–January 2016

Early Release / January 22, 2016 / 65(3):1–4



Morgan Hennessey, DVM¹; Marc Fischer, MD¹; J. Erin Staples, MD, PhD¹ ([View author affiliations](#))

[View suggested citation](#)

Zika virus is a mosquito-borne flavivirus that was first identified in Uganda in 1947 (1). Before 2007, only sporadic human disease cases were reported from countries in Africa and Asia. In 2007, the first documented outbreak of Zika virus disease was reported in Yap State, Federated

Possible Association Between Zika Virus Infection and Microcephaly – Brazil, 2015

Weekly / January 29, 2016 / 65(3):59–62



Format:

On January 22, 2016, this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).

Lavinia Schuler-Faccini, PhD¹; Erlane M. Ribeiro, PhD²; Ian M.L. Feitosa, MD³; Dafne D.G. Horowitz, PhD⁴; Denise P. Cavalcanti, PhD, MD⁵; André Pessoa⁶; Maria Juliana R. Doriqui, MD⁷; Joao Ivanildo Neri, MD⁷; Joao Monteiro de Pina Neto, PhD⁸; Hector Y.C. Wanderley, MD⁹; Mirlene Cernach, PhD¹⁰; Antonette S. El-Husny, PhD¹¹; Marcos V.S. Pone, PhD⁵; Cassio L.C. Serao, MD¹²; Maria Teresa V. Sasseverino, PhD¹³; Brazilian Medical Genetics Society–Zika Embryopathy Task Force¹⁴ ([View author affiliations](#))

[View suggested citation](#)

In early 2015, an outbreak of Zika virus, a flavivirus transmitted by *Aedes* mosquitoes, was identified in northeast Brazil, an area where dengue

Summary

Interim Guidelines for Prevention of Sexual Transmission of Zika Virus – United States, 2016

Early Release / February 5, 2016 / 65(5):1–2



Format:

Alexandra M. Oster, MD¹; John T. Brooks, MD¹; Jo Ellen Stryker, PhD¹; Rachel E. Kachur²; Paul Mead, MD³; Nicki T. Pesik, MD⁴; Lyle R. Petersen, MD⁵ ([View author affiliations](#))

[View suggested citation](#)

Zika virus is a mosquito-borne flavivirus primarily transmitted by *Aedes aegypti* mosquitoes (1,2). Infection with Zika virus is asymptomatic in an estimated 80% of cases (2,3), and when Zika virus does cause illness, symptoms are generally mild and self-limited. Recent evidence suggests a possible association between maternal Zika virus infection and adverse fetal outcomes, such as

Update: Interim Guidelines for Health Care Providers Caring for Pregnant Women and Women of Reproductive Age with Possible Zika Virus Exposure – United States, 2016

Early Release / February 5, 2016 / 65(5):1–6



Format:

Titilope Oduyebo, MD^{1,2}; Emily E. Petersen, MD³; Sonja A. Rasmussen, MD⁴; Paul S. Mead, MD⁵; Dana Meadey-Delman, MD⁶; Christina M. Renquist, MPH⁷; Sascha R. Ellington, MSPH⁸; Marc Fischer, MD⁹; J. Erin Staples, MD, PhD⁹; Ann M. Powers, PhD⁹; Julie Villanueva, PhD⁹; Romeo R. Galang, MD¹⁰; Ada Dieke, DrPH¹¹; Jorge L. Muñoz, PhD¹²; Margaret A. Honein, PhD¹³; Denise J. Jamieson, MD¹⁴ ([View author affiliations](#))

[View suggested citation](#)

CDC has updated its interim guidelines for U.S. health care providers caring for pregnant women during a Zika virus outbreak (1). Updated guidelines include a new recommendation to offer

ZIKA VIRUS: A NEW THREAT

- Reported for first time in Brazil in May 2015
- Evidence of transmission in Puerto Rico, USVI, & more than 2 dozen countries in the Americas
 - Potential for further spread with warmer weather
 - Low likelihood of widespread transmission in contiguous US states
- Difficult to control *Aedes* mosquitoes
- Research underway to understand:
 - Risk of birth defects; Guillain-Barre
 - Better diagnostics
 - Better vector control
 - A vaccine



Countries/territories with active Zika transmission (as of Feb 3, 2016)



Range of *Aedes aegypti* mosquitoes in US

ZIKA: PREVENTION, DETECTION, RESPONSE

Prevention

- Reduce risk to pregnant women
- Mosquito surveillance and control in at-risk and affected areas
- Minimize other forms of transmission (transfusion, organ donation, sexual)

Detection

- Real-time information on infections, adverse health outcomes, mosquito populations and resistance
- Improve laboratory test availability and accuracy (RT-PCR; serology; PRNT)

Response

- Robust response in any area with or at risk for local transmission
- Improve vector surveillance and control
- Care for pregnant women, affected infants, patients with Guillain-Barré syndrome

\$1.9 Billion emergency response request – \$828 Million to CDC

ANTIBIOTIC RESISTANCE IN THE US

We risk turning the clock back 100 years to a time when simple infections could kill

- Threat to economic stability
- Modern medicine is at risk
 - Loss of effective antibiotic treatment could make routine infections deadly
 - Patients who need specialized care such as cancer treatment will be at highest risk
 - Need to act now or even drugs of last resort will soon be ineffective
- \$20 Billion/year in excess health care costs

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*

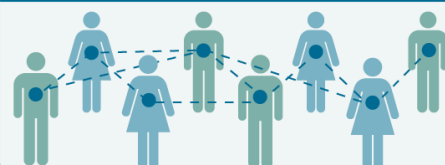
ANIBIOTIC RESISTANCE INITIATIVE

4 core actions to fight antibiotic resistance, reduce infections & save lives

1 Detect and track patterns of antibiotic resistance



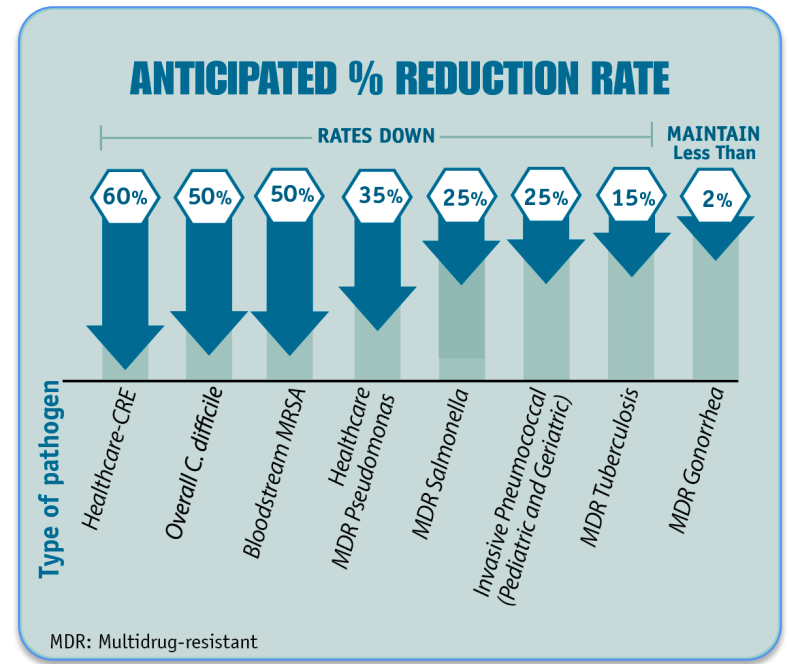
2 Respond to outbreaks involving antibiotic-resistant bacteria



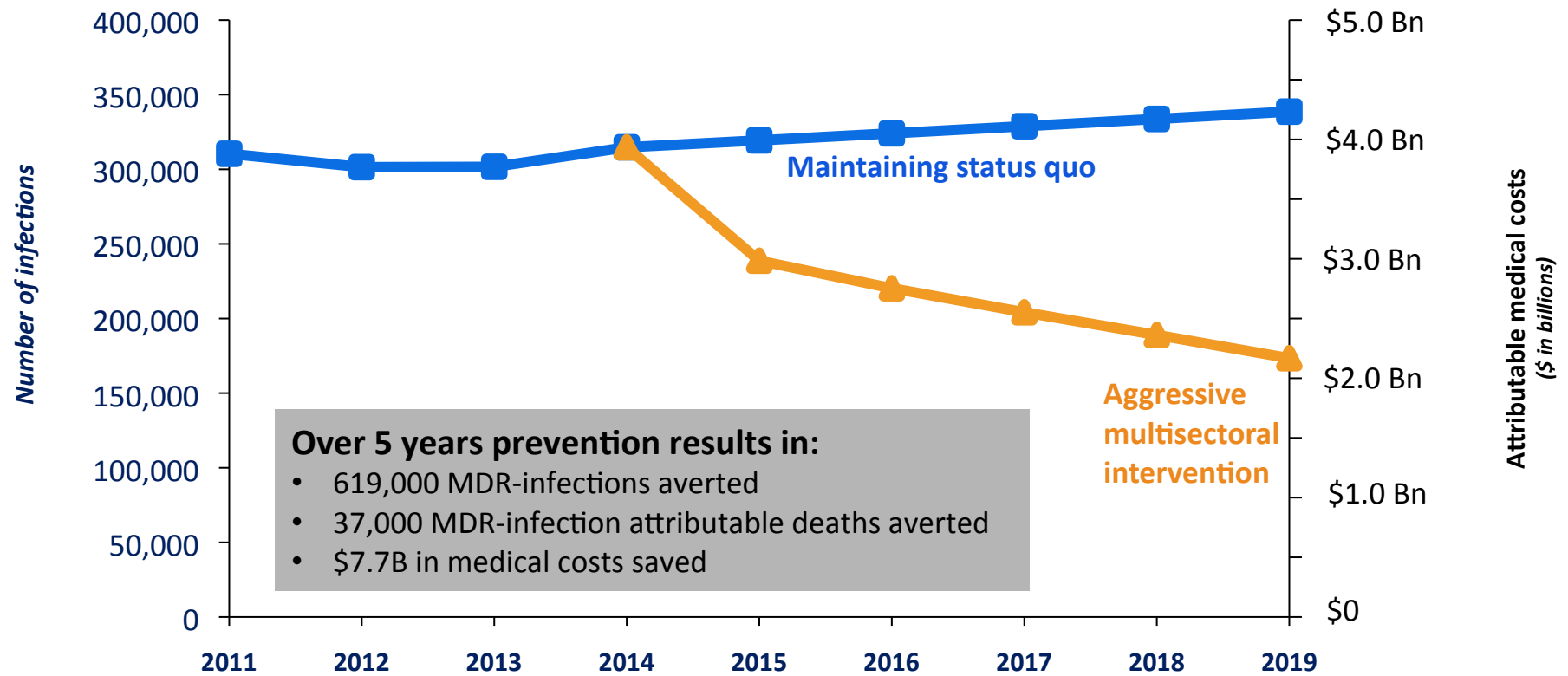
3 Prevent infections from occurring and resistant bacteria from spreading



4 Discover new antibiotics and new diagnostic tests for resistant bacteria



URGENT ACTION CAN SAVE LIVES AND MONEY



STEWARDSHIP

7 key elements to improve antibiotic prescribing practices in hospitals

VitalSigns™
March 2014

Making Health Care Safer

Antibiotic Rx in Hospitals: Proceed with Caution

Antibiotics save lives, but poor prescribing practices are putting patients at unnecessary risk for preventable allergic reactions, super-resistant infections and deadly diarrhea. Errors in prescribing decisions also contribute to antibiotic resistance, making these drugs less likely to work in the future.

To protect patients and preserve the power of antibiotics, hospital CEOs/medical officers can:

- Adopt an antibiotic stewardship program that includes, at a minimum, this checklist:

- Leadership commitment: Dedicate necessary human, financial, and IT resources.
- Accountability: Appoint a single leader responsible for program outcomes. Physicians have proven successful in this role.
- Drug expertise: Appoint a single pharmacist leader to support improved prescribing.
- Action: Take at least one prescribing improvement action, such as requiring reassessment within 48 hours to check drug choice, dose, and duration.
- Tracking: Monitor prescribing and antibiotic resistance patterns.
- Reporting: Regularly report to staff prescribing and resistance patterns and steps to improve.
- Education: Offer education about antibiotic resistance and improving prescribing practices.

Work with other health care facilities to prevent infections, transmission, and resistance.

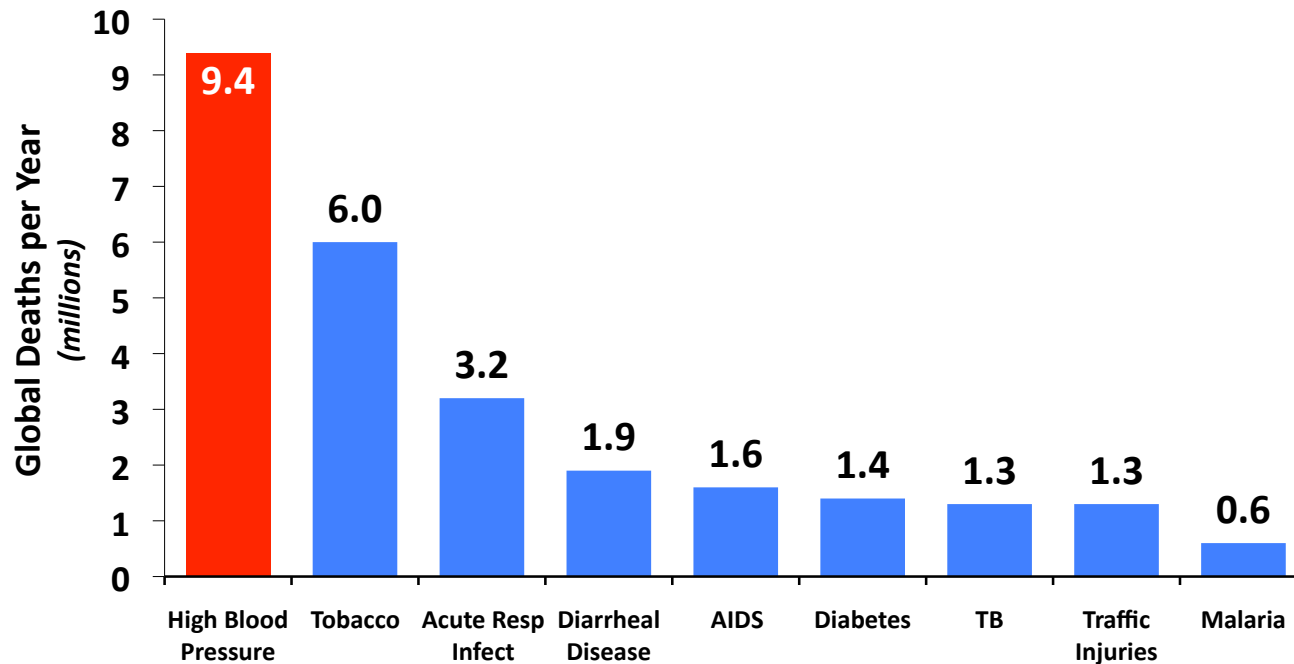
→ See page 4
Want to learn more? Visit
www.cdc.gov/vitalsigns

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

- Leadership commitment
- Accountability
- Drug expertise
- Action
- Tracking
- Reporting
- Education

HIGH BLOOD PRESSURE

The only thing that kills more people globally than tobacco



High blood pressure kills nearly as many people worldwide each year as all infectious diseases combined

HEART DISEASE AND STROKE WILL CONTINUE TO KILL THE MOST PEOPLE WORLDWIDE

2004
(actual)

RANK	CAUSE	%
1	Ischaemic heart disease	12.2
2	Cerebrovascular disease	9.7
3	Lower respiratory infections	7.0
4	Chronic obstructive pulmonary disease	5.1

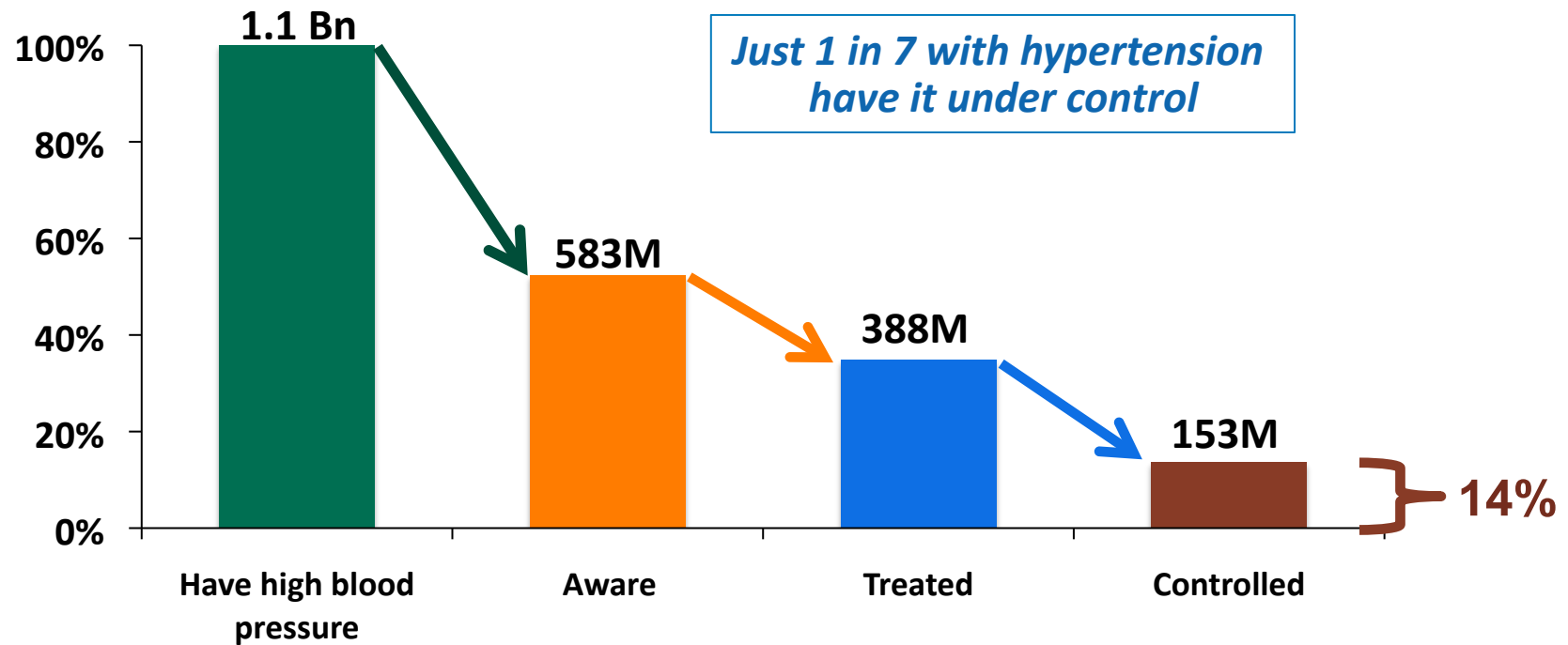
2030
(projected)

RANK	CAUSE	%
1	Ischaemic heart disease	14.2
2	Cerebrovascular disease	12.1
3	Chronic obstructive pulmonary disease	8.6
4	Lower respiratory infections	3.8

The proportion of people worldwide who die from heart disease and stroke will continue to increase – unless we take urgent action now

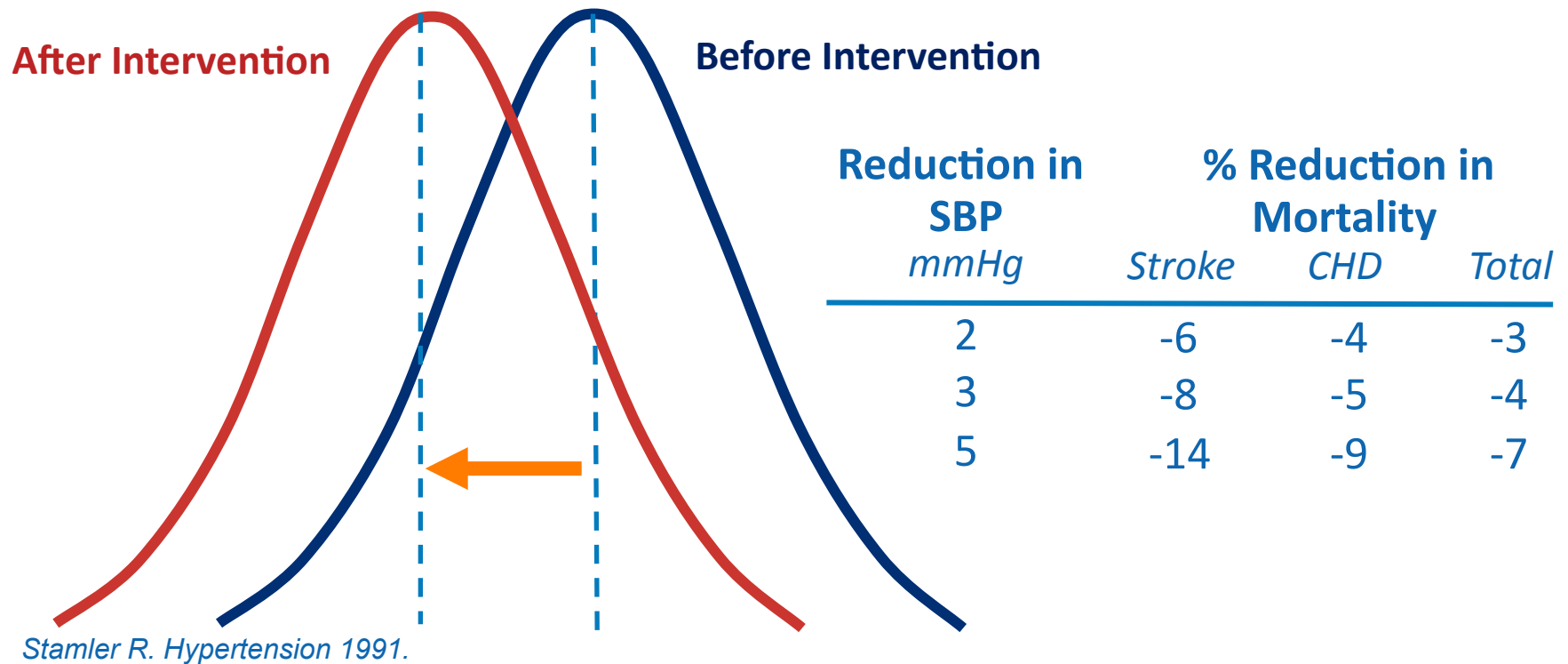
WHO, World Health Statistics, 2008.

MOST OF THE >1 BILLION ADULTS WITH HYPERTENSION WORLDWIDE DO NOT HAVE IT UNDER CONTROL

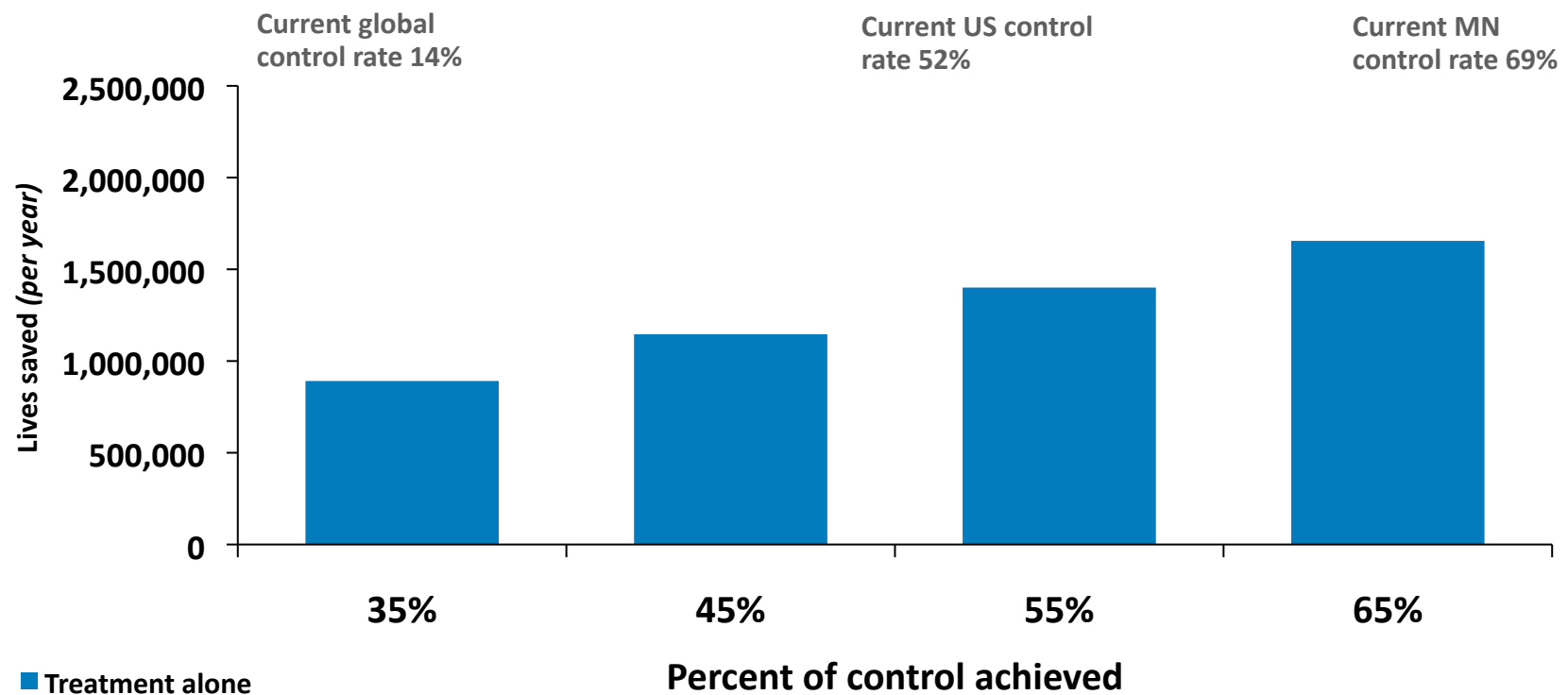


Pereira et al., J Hypertens 2009;27:963-975.

POPULATION-BASED STRATEGIES WILL REDUCE HYPERTENSION PREVALENCE AND DEATH

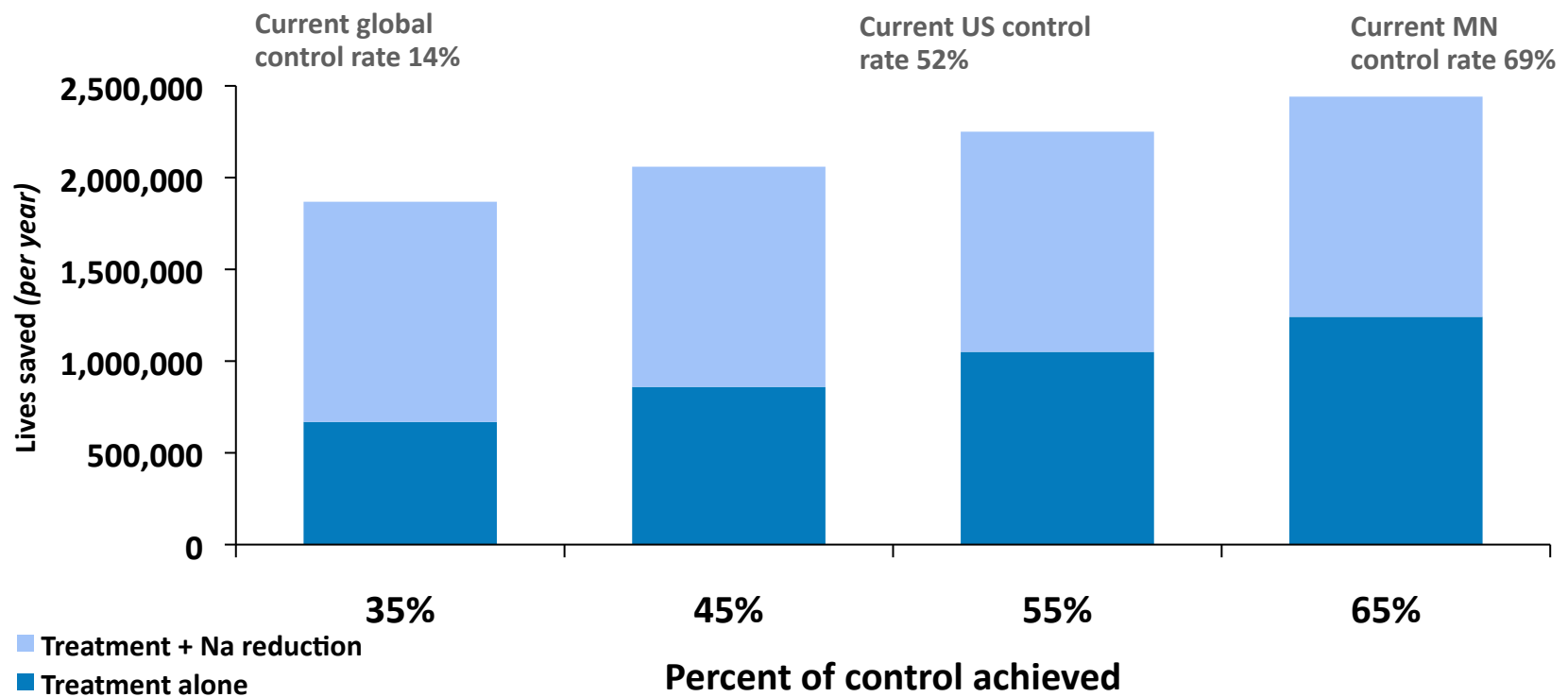


BETTER CONTROL OF BLOOD PRESSURE COULD SAVE MORE THAN A MILLION LIVES A YEAR WORLDWIDE



Based on data from: Bibbins-Domingo et al. NEJM 2010;362:590-599 & Farley TA et al. Am J Prev Med 2010;38:600-609.

REDUCING SODIUM INTAKE IN CONJUNCTION WITH TREATMENT COULD SAVE EVEN MORE LIVES



Based on data from: Bibbins-Domingo et al. NEJM 2010;362:590-599 & Farley TA et al. Am J Prev Med 2010;38:600-609.



We are all connected by the air we breathe... the water we drink... the food we eat... the space we occupy



Saving Lives.
Protecting People.™