NIAID Update for the Medical University of South Carolina

Matthew J. Fenton, Ph.D.
Director, Division of Extramural Activities, NIAID

July 14, 2017

National Institute of Allergy and Infectious Diseases

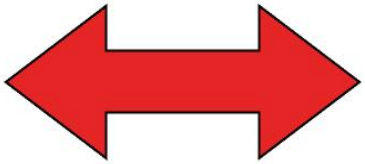
NIAID Mission

Conduct and support basic and applied research to understand, treat and prevent infectious, immunologic, and allergic diseases

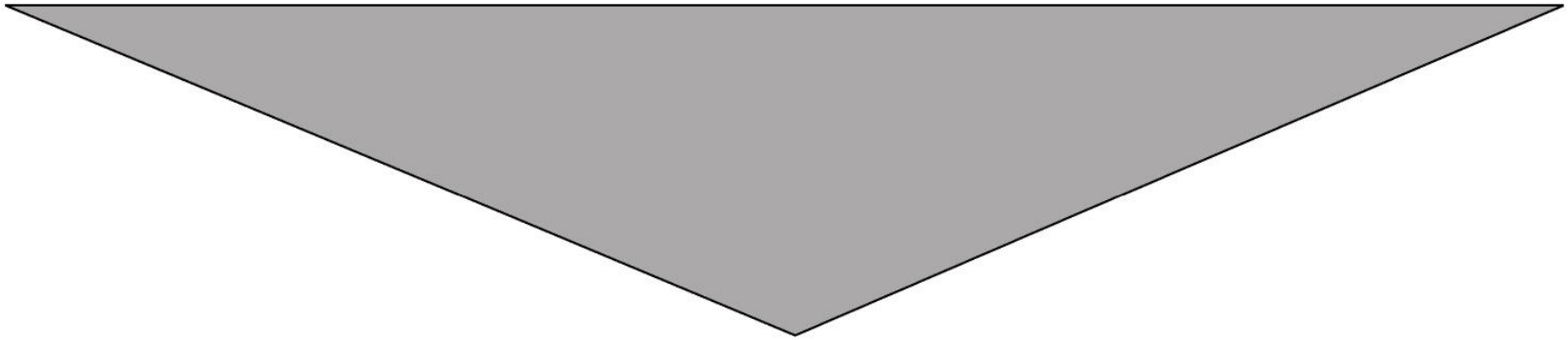
National Institute of Allergy and Infectious Diseases

NIAID Infectious Disease Research: A Dual Mandate

Maintain and "grow" a robust basic and applied research portfolio in microbiology, immunology and clinical research



Respond rapidly to new infectious disease threats



New/Improved Countermeasures

National Institute of Allergy and Infectious Diseases

NIAID Organizational Structure

Office of the Director

Director
Anthony S. Fauci, M.D.

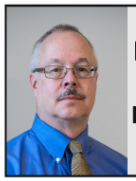
Principal Deputy Director
Hugh Auchincloss, M.D.

Associate Director for International Research Affairs
F. Gray Handley, M.S.P.H.

Deputy Director for Science Management
John J. McGowan, Ph.D.

Deputy Director for Clinical Research and Special Projects
H. Clifford Lane, M.D.

Division of Clinical Research
H. Clifford Lane, M.D.
Director



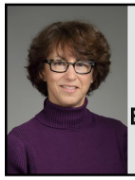
Division of Extramural Activities
Matthew J. Fenton, Ph.D.
Director

Division of Acquired Immunodeficiency Syndrome
Carl W. Dieffenbach, Ph.D.
Director

Division of Allergy, Immunology, and Transplantation
Daniel Rotrosen, M.D.
Director

Vaccine Research Center
John R. Mascola, M.D.
Director

Division of Intramural Research
Steven M. Holland, M.D.
Director



Division of Microbiology and Infectious Diseases
Emily J. Erbelding, M.D., M.P.H.
Director

NIH National Institute of Allergy and Infectious Diseases

Topics

- NIAID Budget
- Success Rates
- Next Generation Researchers Initiative
  - Supporting Early Stage Investigators
- Research Training
  - New Programs for Physician Scientists
- Global Health Update

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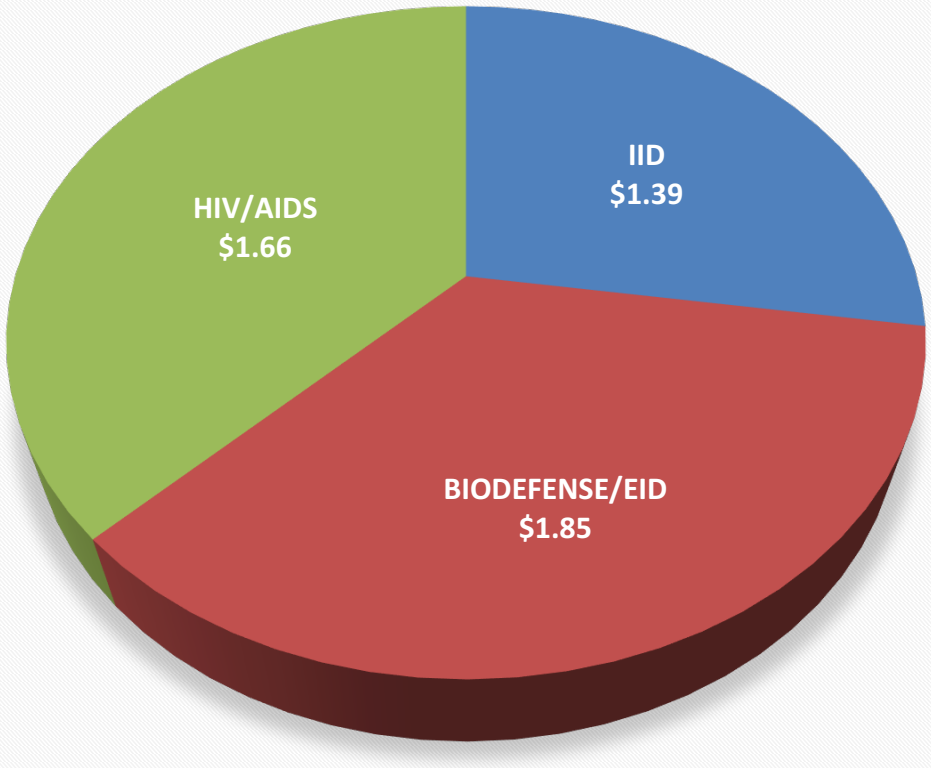
NIH Budget Comparison by Institute and Center (Dollars in Thousands)

IC	FY 2016 Operating	FY 2017 Operating	Percent Change
NCI	$ 5,206,292	$ 5,659,955	8.7%
NIAID	4,749,897	4,905,718	3.3%
NHLBI	3,109,221	3,209,929	3.2%
NHGRI	512,509	528,346	3.1%
NCATS	684,468	704,330	2.9%
NIGMS	2,508,960	2,646,152	5.5%
NIA	1,596,031	2,048,814	28.4%
Other ICs	12,244,318	12,668,725	3.5%
Subtotal	$ 30,611,696	$ 32,371,969	5.8%
OD	1,570,790	1,728,603	10.0%
B&F	128,863	128,567	-0.2%
Total	$ 32,311,349	$ 34,229,139	5.9%

FY 2017 Appropriation



TOTAL $4.9B

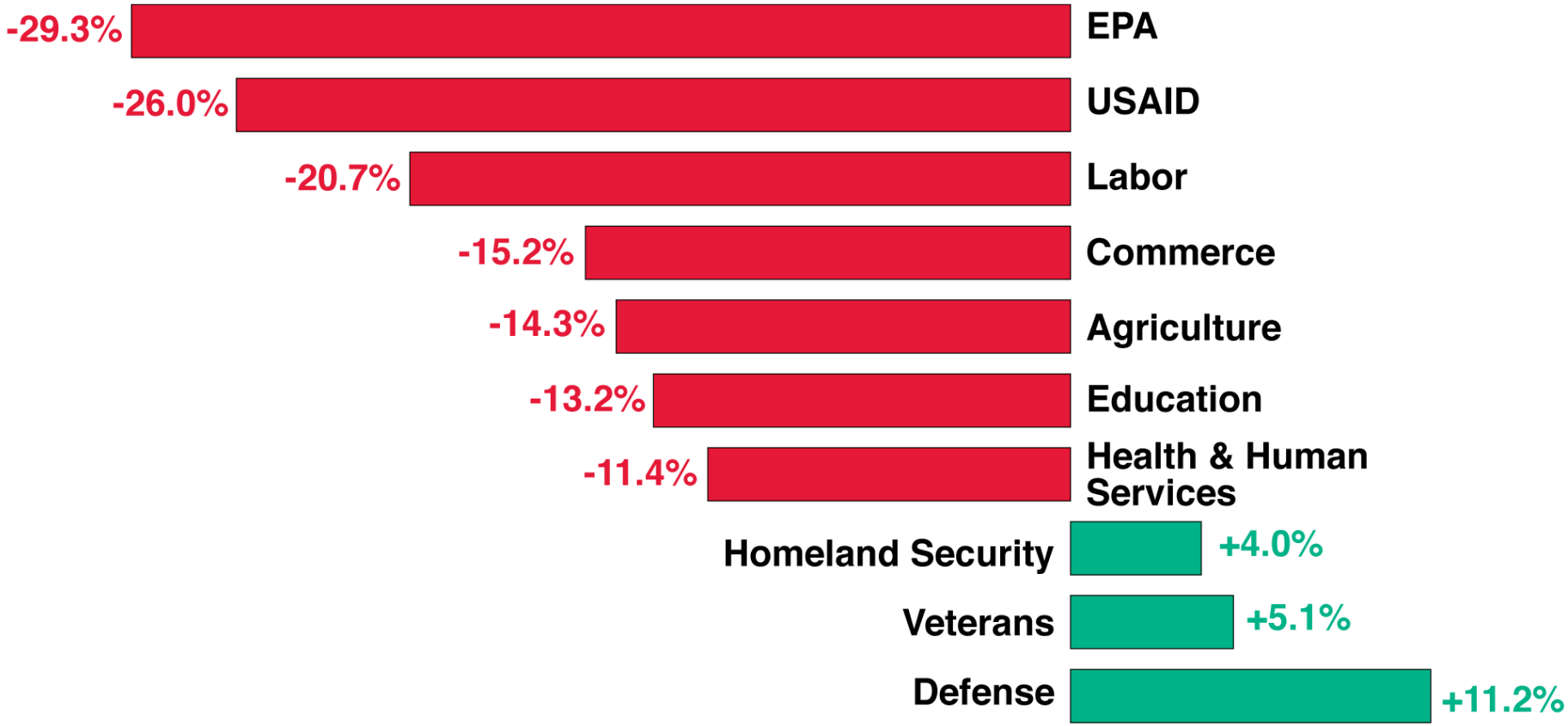
National Institute of Allergy and Infectious Diseases

NIAID FY 2017 Financial Management Policy

- **R01 Payline**
  - **Established PI: 11th Percentile**
  - **New PI: 18th Percentile**
- **Non-competing and Competing grants: no adjustments**
- **Competing research initiatives: no cuts will be made in FY 2017 beyond previously planned levels for initiatives that were set by the program divisions in FY 2015 (some cuts, up to 10%)**
- **Bridge Awards: $18M**
- **Select Pay: $9M**

Note: R21 final payline set at an overall priority score of 28

Proposed Cuts/Increases to Selected Agencies in Budget Blueprint



National Institute of Allergy and Infectious Diseases

NIAID Funding, FY 2010-2018

FY18 President's Budget

National Institute of Allergy and Infectious Diseases

May 17, 2017

Science

Lawmakers Decry Trump Plan to Slash NIH 2018 Budget

By Jocelyn Kaiser

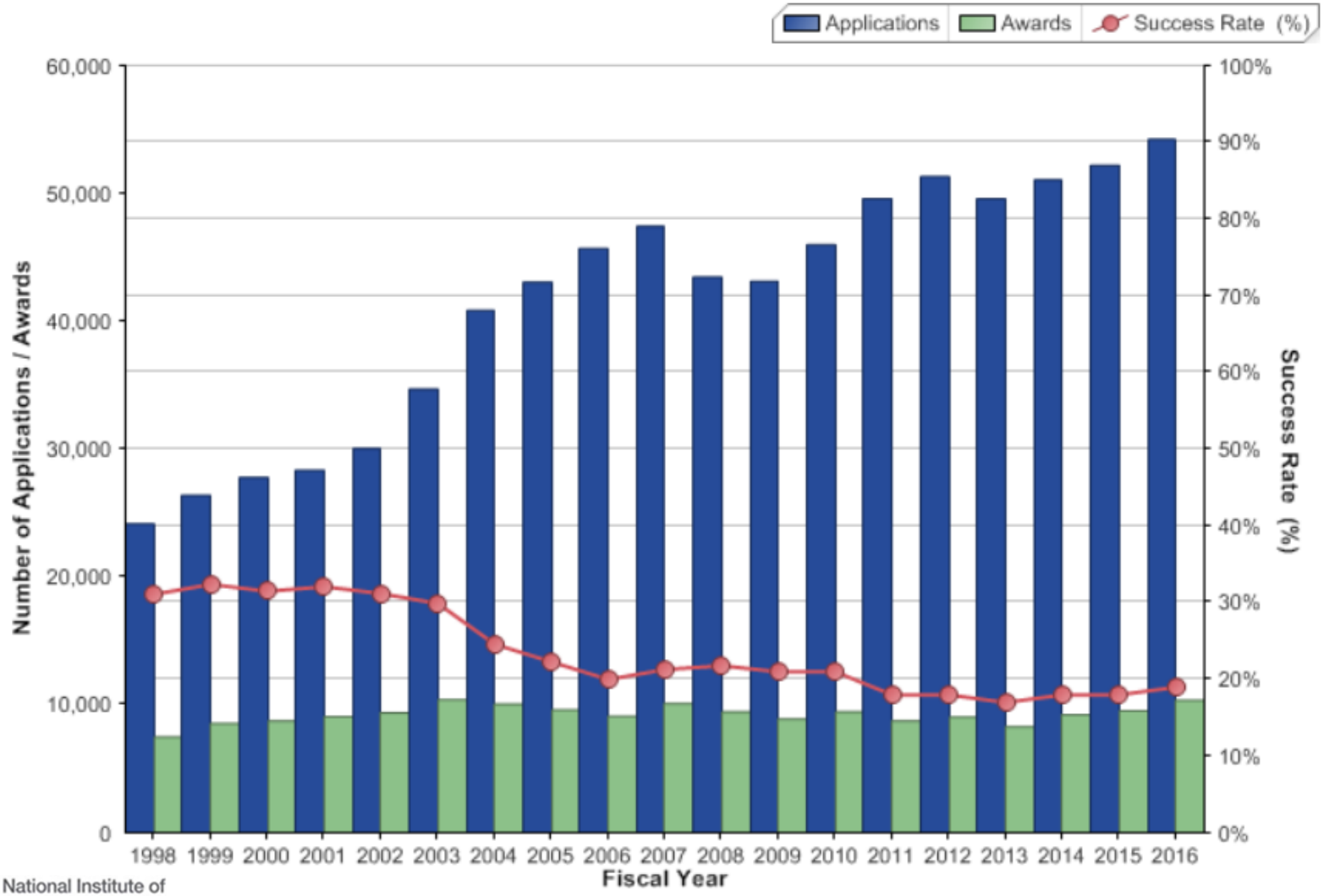
Lawmakers from both sides of the aisle in the U.S. House of Representatives today voiced their displeasure with the Trump administration's proposed . . . cut next year to the budget of the National Institutes of Health (NIH)….

July 12, 2017 House Appropriation Bill for FY 2018 proposes a $1.1B increase in the NIH budget

Topics

- NIAID Budget
- Success Rates
- Next Generation Researchers Initiative
  - Support for Early Stage Investigators
- Research Training
  - New Programs for Physician Scientists
- Global Health Update

NIH RPG Success Rates Have Remained Relatively Flat for a Decade

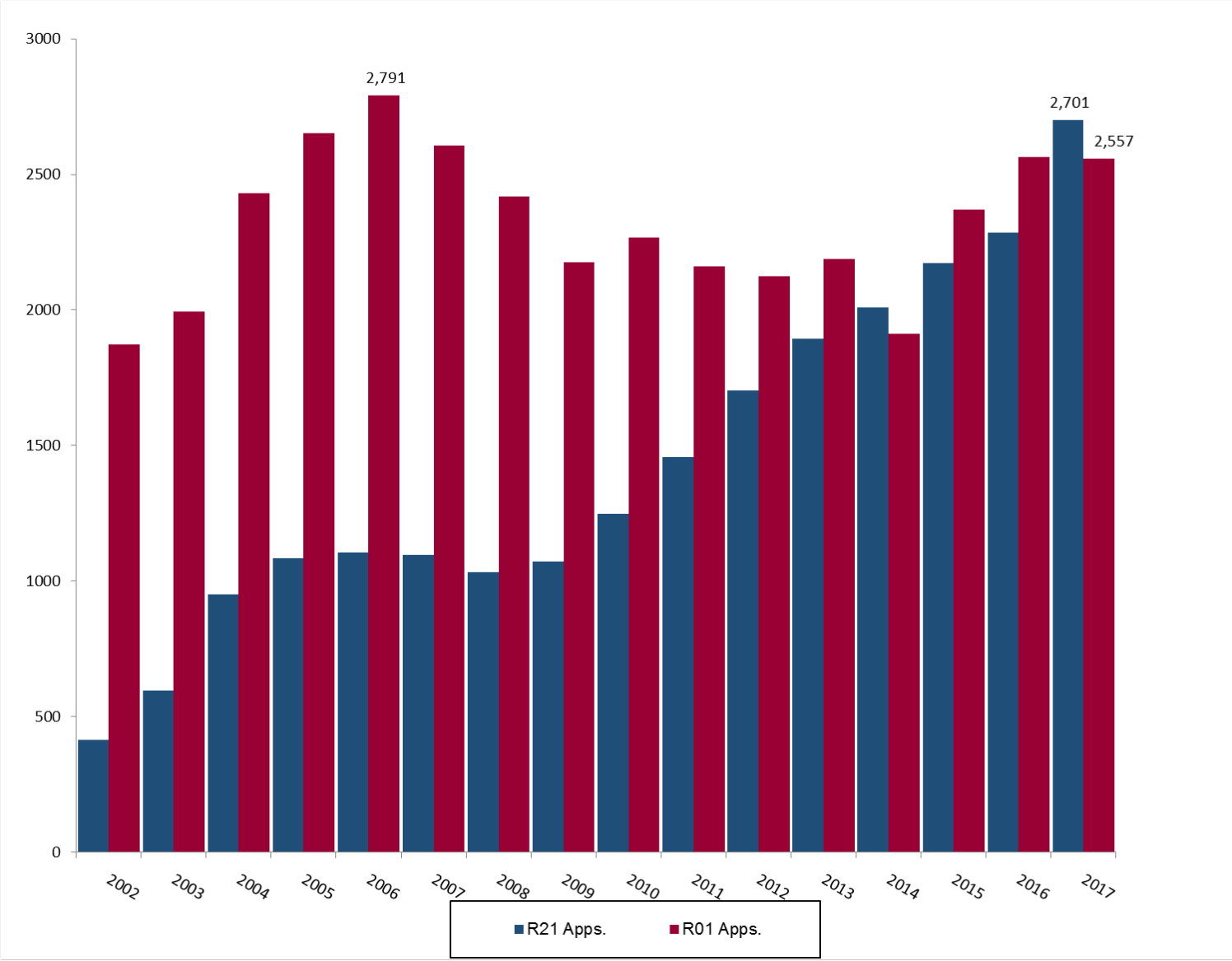


National Institute of Allergy and Infectious Diseases

RPG Key Metrics

	FY 2014 actual	FY 2015 actual	FY 2016 actual	*FY 2017 est.*	*FY 2018 est.*
Success Rates					
All RPGs	21.9%	21.4%	24.0%	*20% - 22%*	*17% - 21%*
R01 (Unsolicited)	19.7%	19.0%	22.7%	*16% - 20%*	*15% - 19%*
R21 (Unsolicited)	17.2%	21.7%	22.8%	*16% - 20%*	*15% - 19%*
Average Cost					
R01 (Unsolicited)	$451	$440	$498	*$501 - $510*	*$511 - $525*

Unsolicited R21 vs. R01 Growth



Topics

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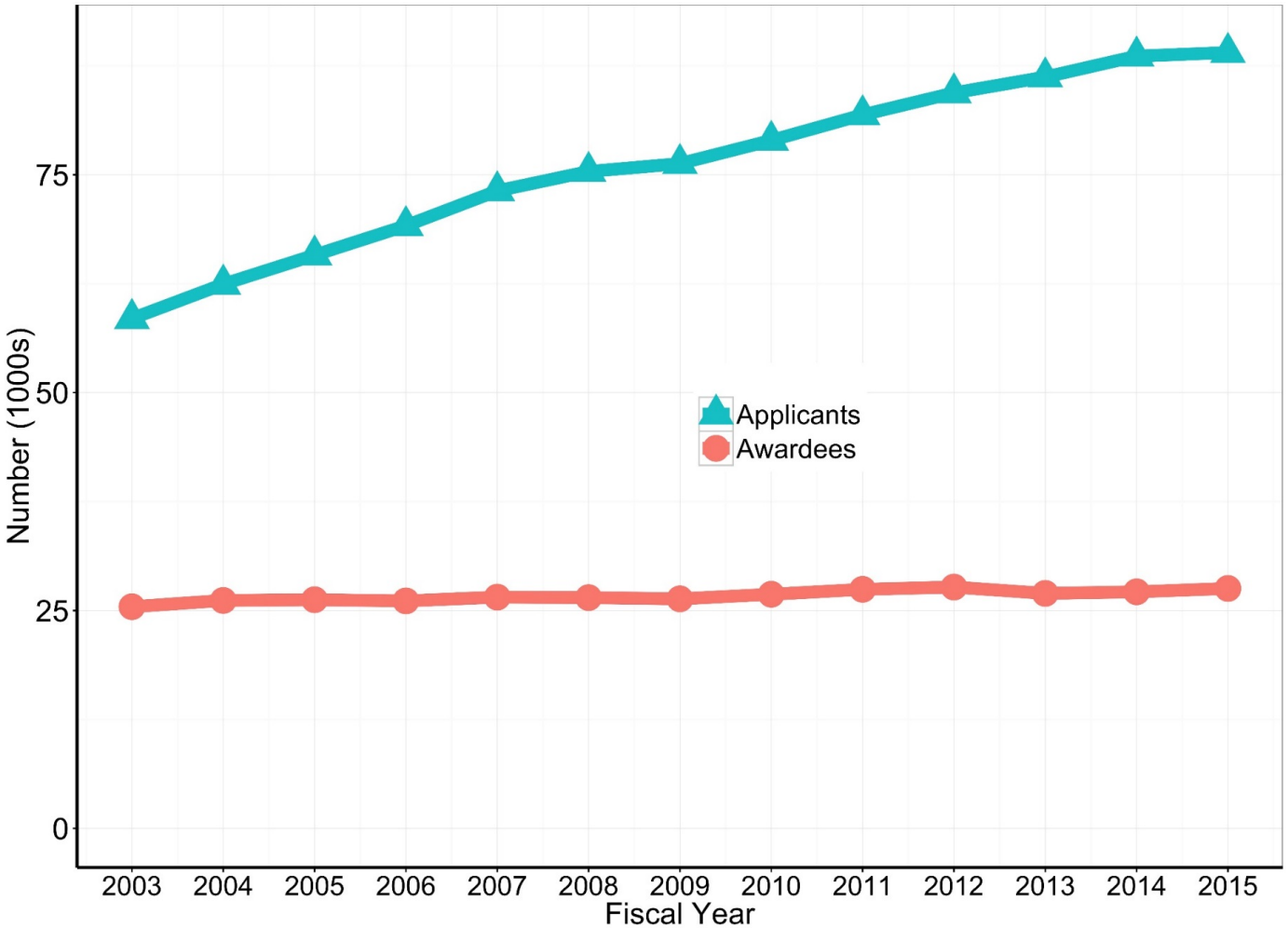
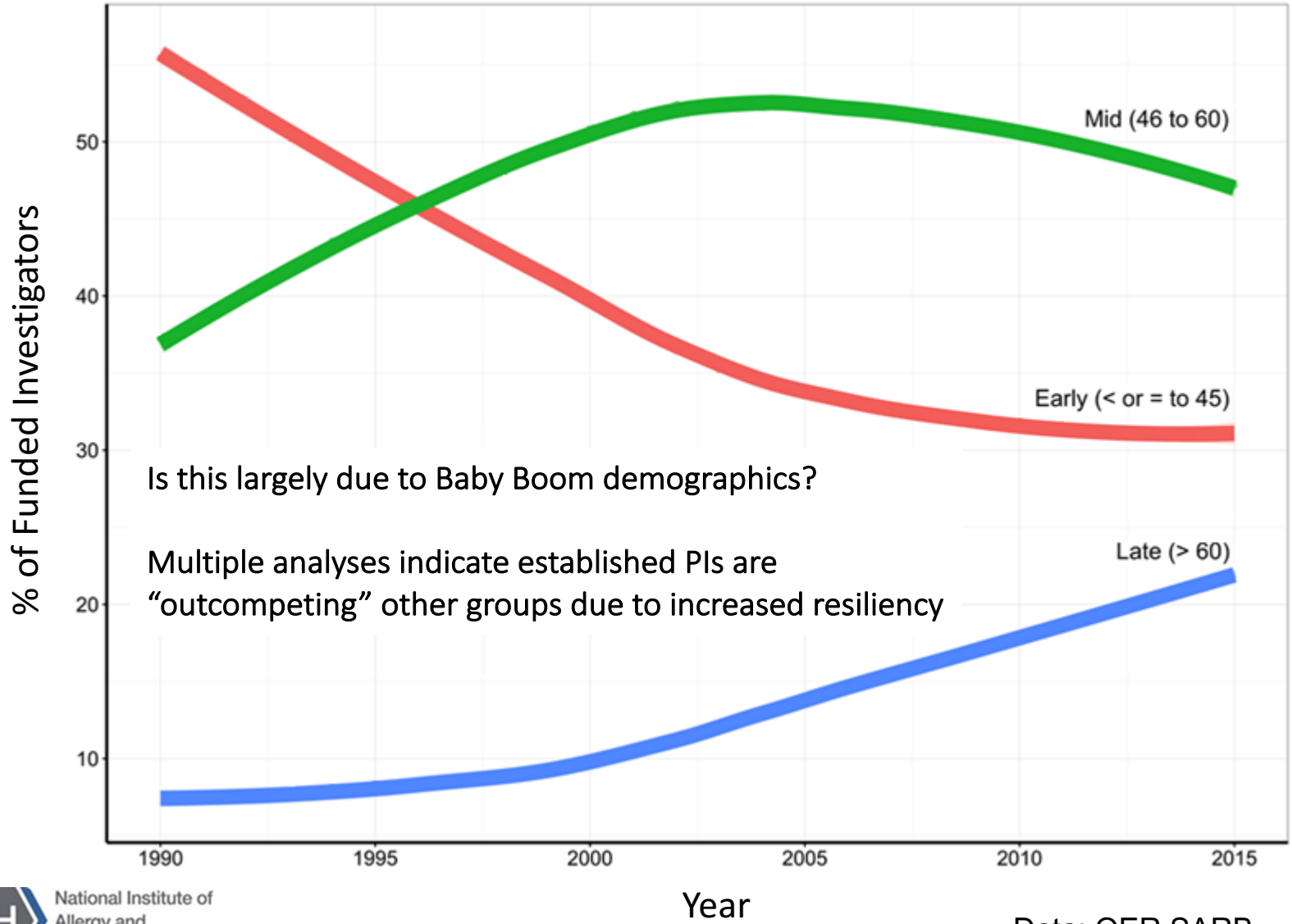
Hypercompetition: Applicants and Awardees for NIH RPGs



National Institute of Allergy and Infectious Diseases

Data: OER SARB

Who Are The Winners and Losers?



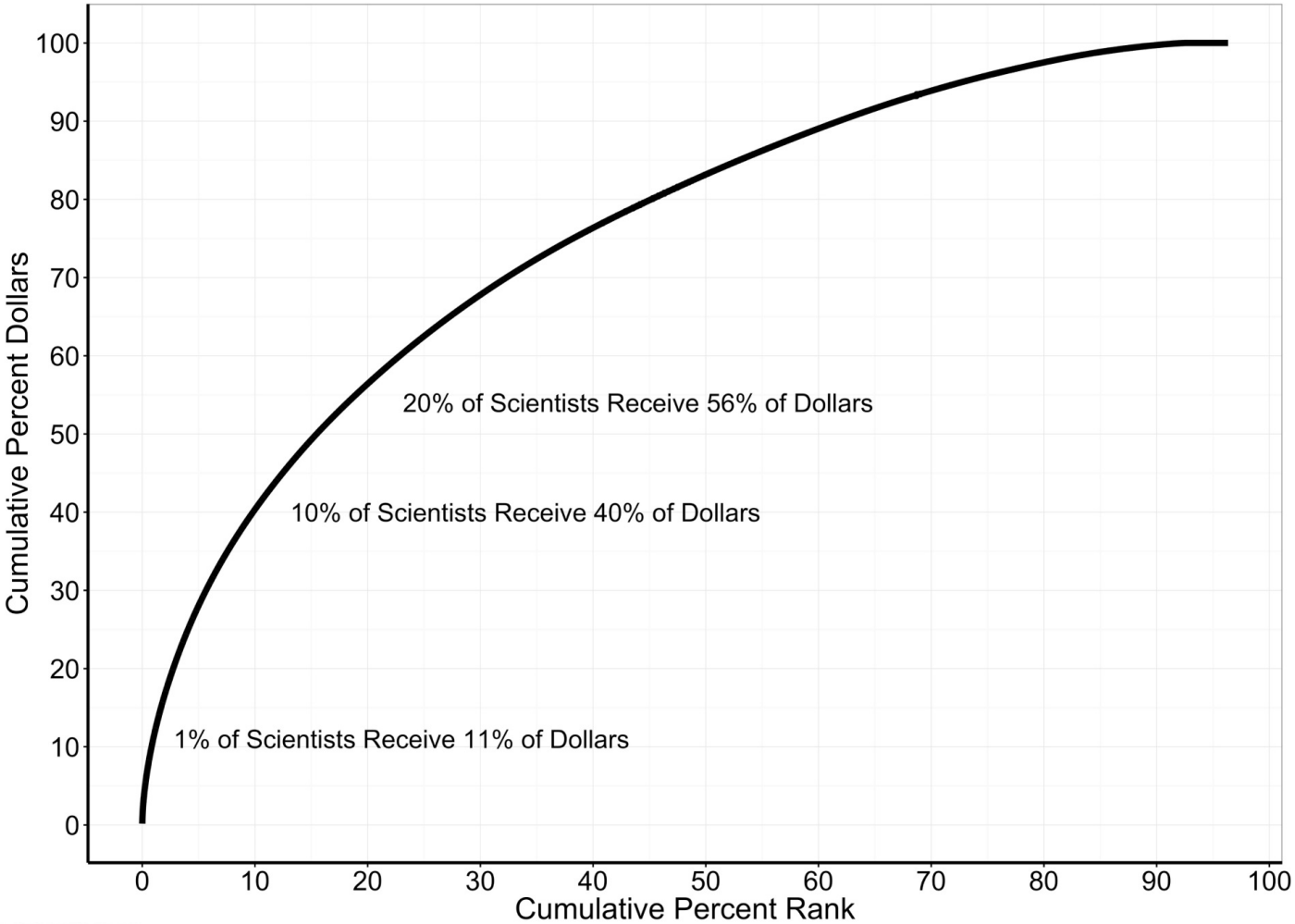
Is this largely due to Baby Boom demographics?

Multiple analyses indicate established PIs are "outcompeting" other groups due to increased resiliency

Data: OER SARB

National Institute of Allergy and Infectious Diseases

Background: Skewed Distribution of Resources



National Institute of Allergy and Infectious Diseases

Data: OER SARB

NIH Will No Longer Propose a Cap on Grants (Grant Support Index)

- Too difficult to account for collaborative activities. Major concern that the Grant Support Index (GSI) would discourage collaboration and team science
- Skepticism about data underpinning the analysis NIH used to formulate GSI
- Potential to redistribute grant funding from well-funded, well-established PIs to less-well-funded, younger and mid-career PIs
- There is still broad support for addressing underlying problem of early- and mid-career PIs dropping out of the pipeline
  - Note that over 40% of NIAID PIs who received a New Investigator R01 drop out 6-10 years after receiving their first R01

Next Generation Researcher Initiative: Goals

- To increase the number of early stage investigators (ESI) funded
- To increase the number of mid-career investigators who obtain their second R01 equivalent
- To stabilize the career trajectories of all scientists
- To maximize the impact of NIH funding

See: https://grants.nih.gov/ngri.htm

Next Generation Researcher Initiative: Implementation

- Apply a similar strategy as the NIH New PI policy
  - Define metrics and set targets
  - Let ICs decide how they can best achieve targets
  - Track progress
- Set aside funds to support additional meritorious ESI and mid-career Investigators
  - $200M/year in first year, and an additional ~$200M/year for 4 additional years (for a total of 5 years), reaching a steady state cost of ~$1B
- NIAID has already raised its New Investigator R01 payline to the 18th percentile

Topics

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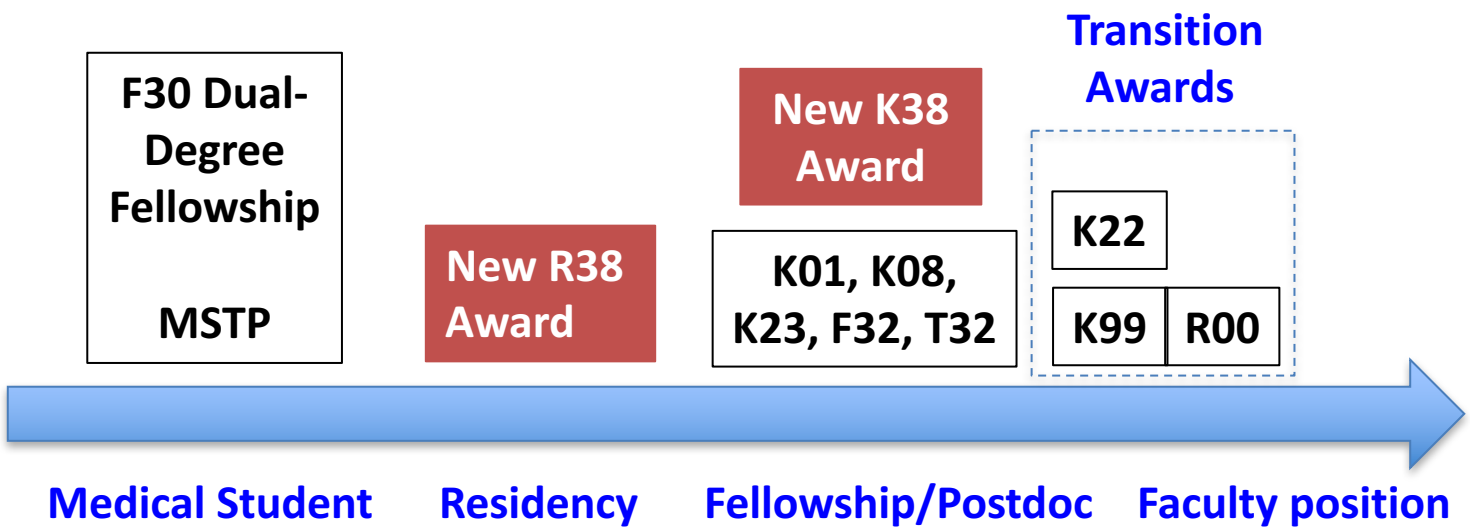
  - Supporting Early Stage Investigators
- Research Training
  - New Programs for Physician Scientists (PS)
- Global Health Update

PS Training FOAs Most Frequently Used at NIAID

- MSTP and F30 dual degree fellowship (medical students)
- T32 (supports clinical fellows)
- K01 mentored research scientist development award
- K08 mentored clinical scientist research career development award
- K23 mentored Patient-Oriented Research career development award (limited to only POR)
- K22 career transition award (2 yr)
- K99/R00 pathway to independence award (2 yr + 2 yr)

NIH Programs That Support PS



National Institute of Allergy and Infectious Diseases

Percentage of NIAID Training Budget Used to Support PS and PS Trainees

Training Program	# PS and PS Trainees	Total # Participants in the Program	Percent of Budget Spent on PS and PS Trainees
Ts	210	899	23%
Ks	24	205	12%
Fs	181	225	74%

Research in Residency: NIH StARR Program

- Stimulating Access to Research in Residency (StARR)
- New NIH FOA to be published shortly
- Institutes participating to date: NIAID, NCI, NHLBI
- This is a two-phase award
  - Institutional phase that supports residents
  - Individual phase that supports fellows (portable)

StARR Pilot Program

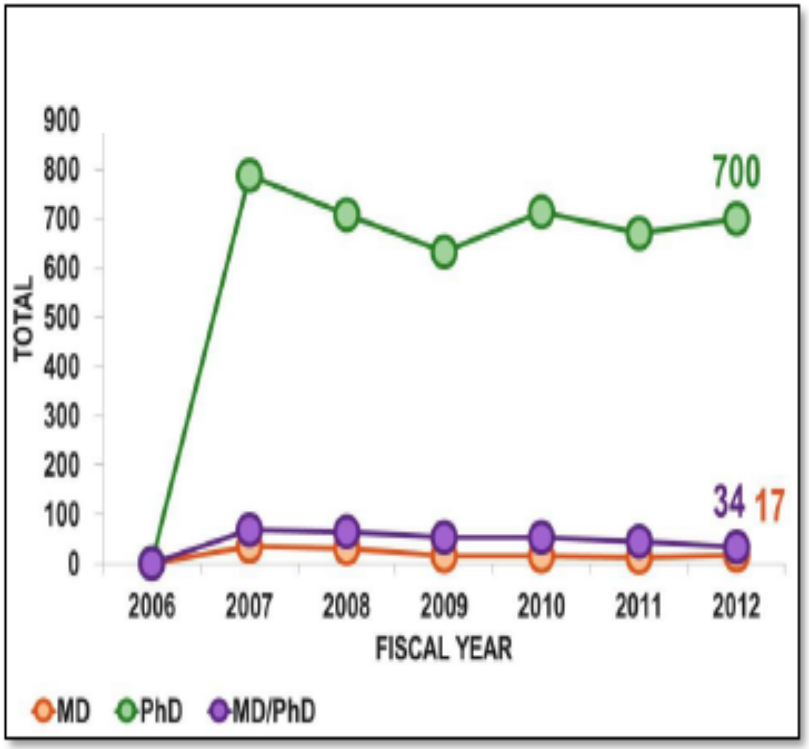
- Phase I (R38) institutional awards: 5 yr award, 1 award/institution/yr supporting multiple residents
- No more than 16 R38 awards/yr across all participating Institutes during this pilot
- Peer review needed to approve progression to the Phase II (K38) award
- Phase II (K38) individual awards: support for up to 2 yr of research support at 80% PGY salary plus $10K/yr research support
  - About $100K/yr/participant in direct costs plus 8% indirect costs

StARR Program Timeline

- July-August, 2017 - FOA Release
- October, 2017 - Application Receipt Date
- July, 2018 - First R38 Awards

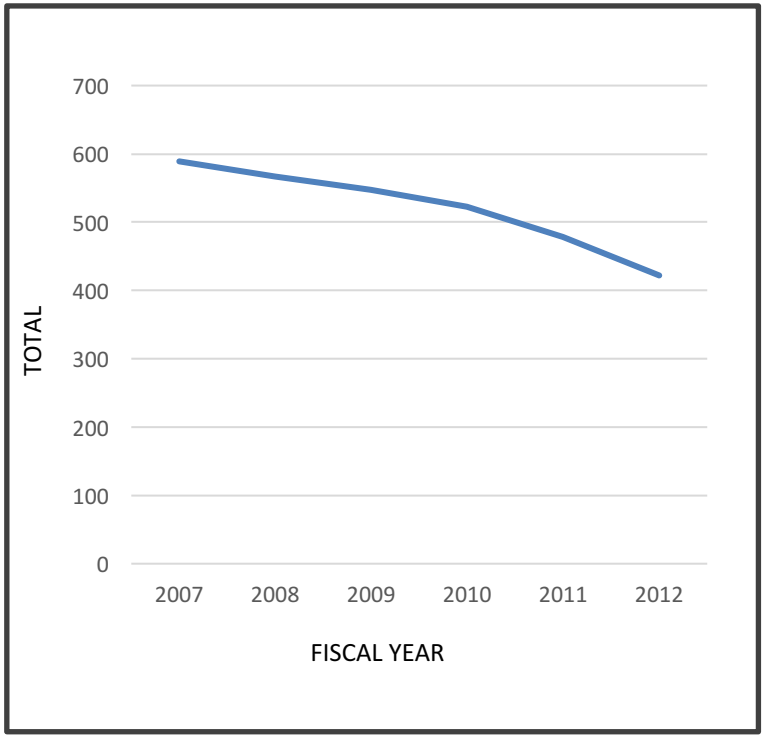
PS Interest in K Programs

NIH K99 Applicants: PhD, MD & MD/PhD
(FY07 - FY12)



PSW Report, 2014; figure 3.32

NIH K08 Clinical Scientist Applicants:
(FY07 - FY12)



IMPAC II database

New NIAID K99/R00 for PS

- A new NIAID K99/R00 award for young PS to support transition to an independent academic faculty position
- A new K99/R00 restricted to PS would create a targeted pool of funds to support PS applicants
- These PS K99/R00 applications would be reviewed their own Special Emphasis Panel
- These grants could have their own pay line

New NIAID K99/R00 for PS

- New NIAID K99/R00 award for residents, clinical fellows, instructors and clinical assistant professors to support their transition to an independent academic faculty position; restricted to PS
- 50% minimum effort to attract clinical trainees
- Proposed research must be in a NIAID mission area with at least 1 clinical/translational aim
- Provide up to 2 years of K99 (up to $100K salary & res) and 2 years of R00 (up to $249K salary & res) support
- ***Anticipate*** release FOA in FY2018

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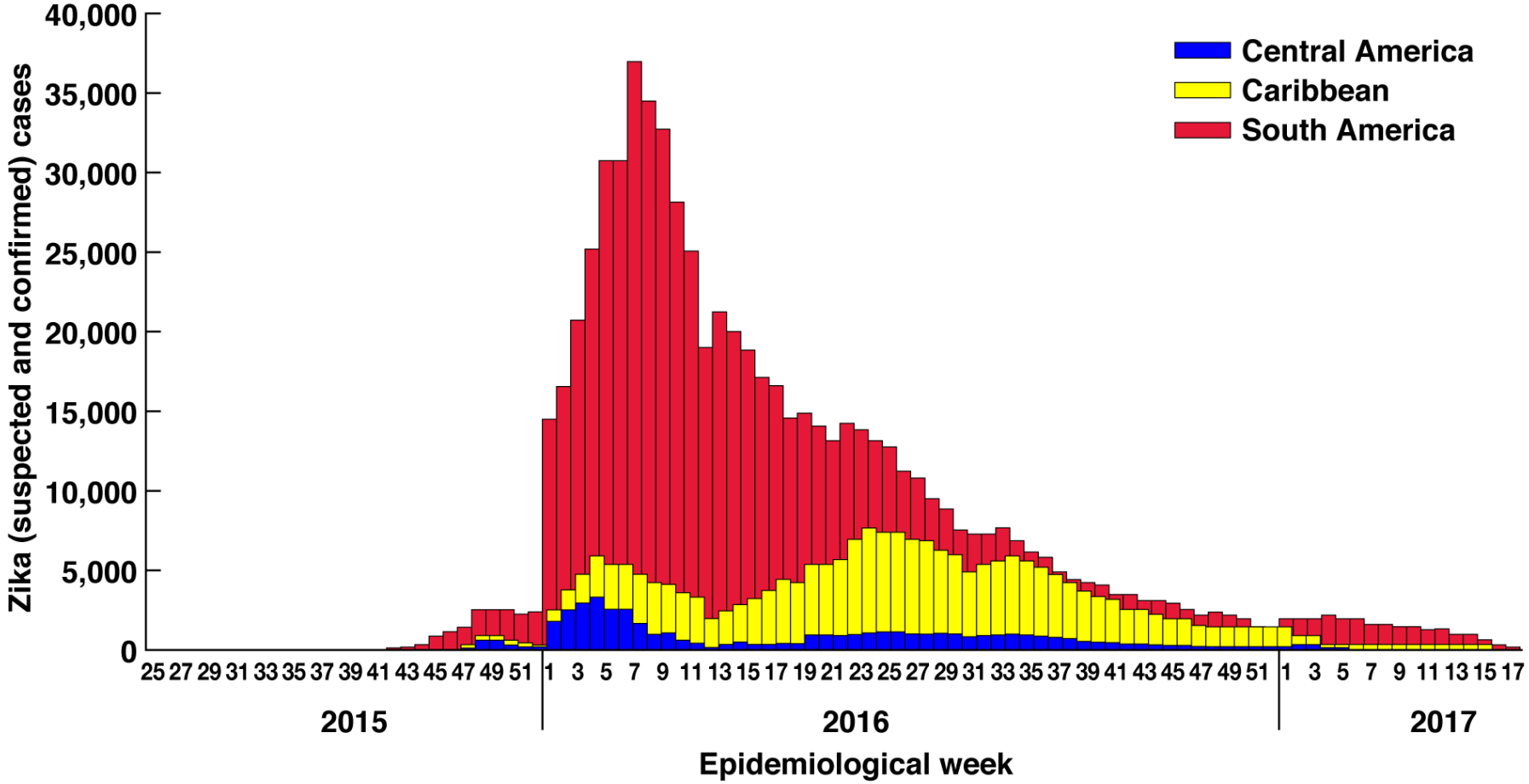
Suspected and Confirmed Zika Cases in the Americas, 2015-2017



Source: PAHO, 5/25/2017.

National Institute of Allergy and Infectious Diseases

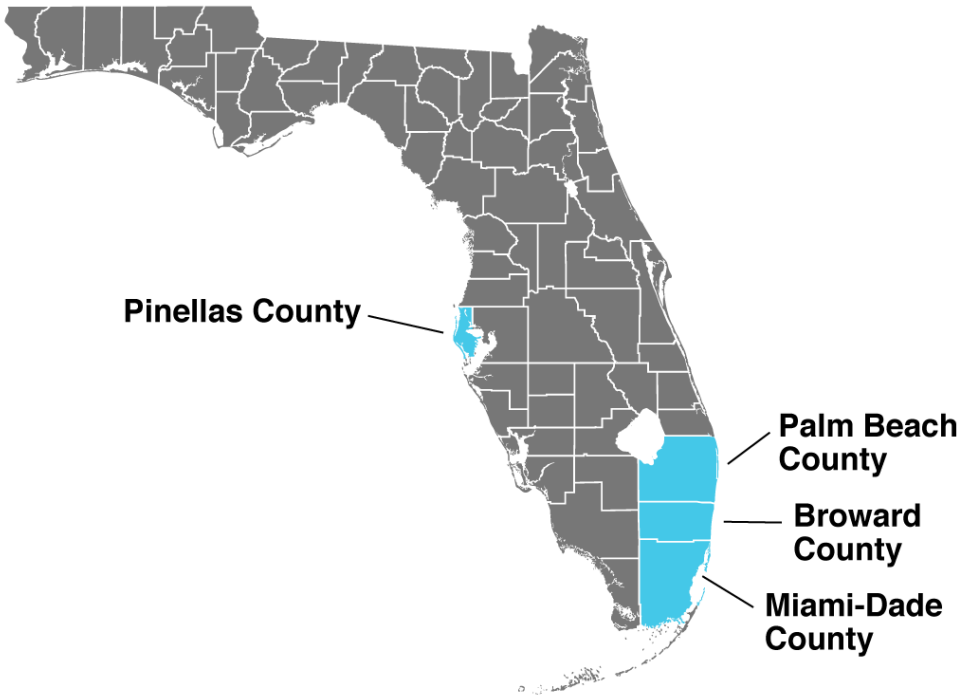
Reported Cases of Zika Virus Disease in the United States, 2015–2017

- **U.S. States / District of Columbia**
  - **5,285 cases***
    - 5,031 travel-associated
    - 224 locally acquired mosquito-borne
    - 46 sexually transmitted
    - 1 laboratory-acquired, 1 unknown
- **U.S. Territories**
  - **36,583 cases***
    - 36,440 locally acquired
    - 143 travel-associated

*Excludes congenital cases

Source: CDC, data as of May 31, 2017

Locally Acquired Mosquito-Borne Zika Infections in Florida and Texas, 2016-2017



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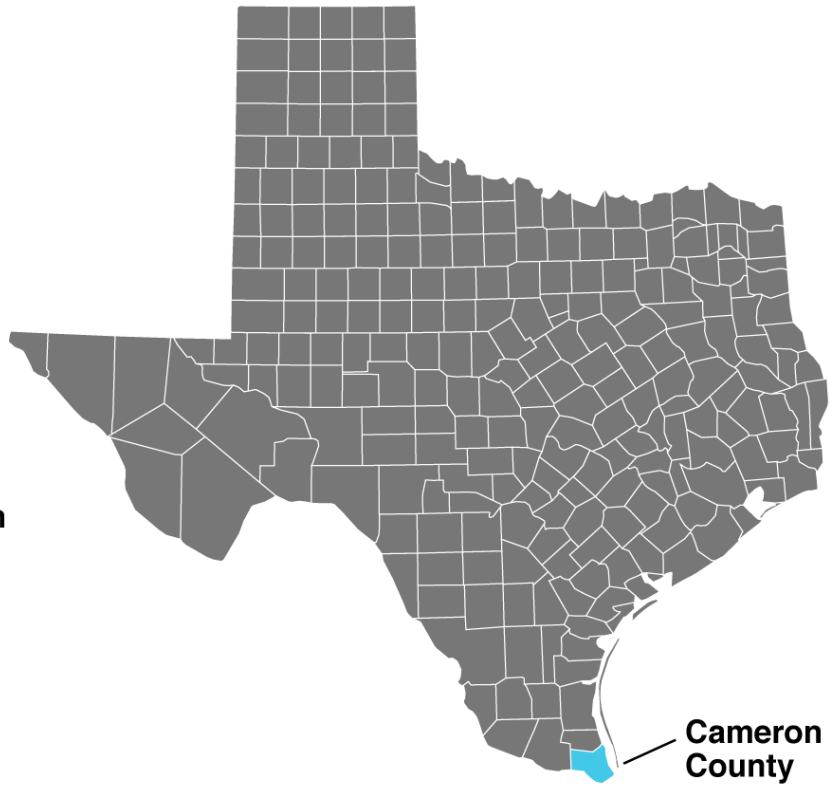

N=6

Source: CDC, data as of May 31, 2017

National Institute of Allergy and Infectious Diseases

Zika-Affected Pregnancies and Outcomes in the United States, 2015-2017

- U.S. States / District of Columbia
  - **1,883 pregnancies**
    - 1,579 completed pregnancies with or without birth defects
    - 72 liveborn infants with birth defects
    - 8 pregnancy losses with birth defects
- U.S. Territories
  - **3,916 pregnancies***

*CDC is not reporting numbers for adverse pregnancy outcomes in the territories at this time

Source: CDC, data as of May 23, 2017

- **In 2016, 10% of pregnant women in the U.S. with confirmed Zika infection had a fetus or baby (n=51) with birth defects**
- **15% of women infected in the first trimester had an affected fetus or baby**

U.S.News & WORLD REPORT

March 9, 2017

Doctors Tie Zika Virus to Heart Problems in Some Adults

- 8 adult patients with Zika infection in Venezuela developed serious cardiovascular complications

Cell

Available online 27 April 2017

Zika Virus Persistence in the Central Nervous System and Lymph Nodes of Rhesus Monkeys

M Aid, DH Barouch et al.

- Virus cleared from peripheral blood within 7-10 days, but persisted in CSF for up to 42 days and in lymph nodes and colorectal tissue for up to 72 days

NIH Zika Vaccine Candidates

- **DNA vaccine** (NIAID VRC)
- **Zika purified inactivated vaccine** (WRAIR/NIAID/BARDA and Sanofi Pasteur)
- **Live-attenuated Zika/dengue chimeric virus** (NIAID intramural/Butantan)
- **mRNA vaccine candidate** (NIAID VRC, GSK)
- **Vesicular Stomatitis Virus vectored vaccine** (NIAID extramural)

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National Institutes of Health
Turning Discovery Into Health

FOR IMMEDIATE RELEASE
Friday, March 31, 2017

News Release

Phase 2 Zika Vaccine Trial Begins in U.S. and Central and South America

Study Will Evaluate NIH's Experimental DNA Vaccine

- **Enrollment target: at least 2,490 individuals in the continental United States, Puerto Rico, Brazil, Peru, Costa Rica, Panama and Mexico**

National Institute of Allergy and Infectious Diseases

Phase 2/2b: ZIKV DNA Vaccine Candidate

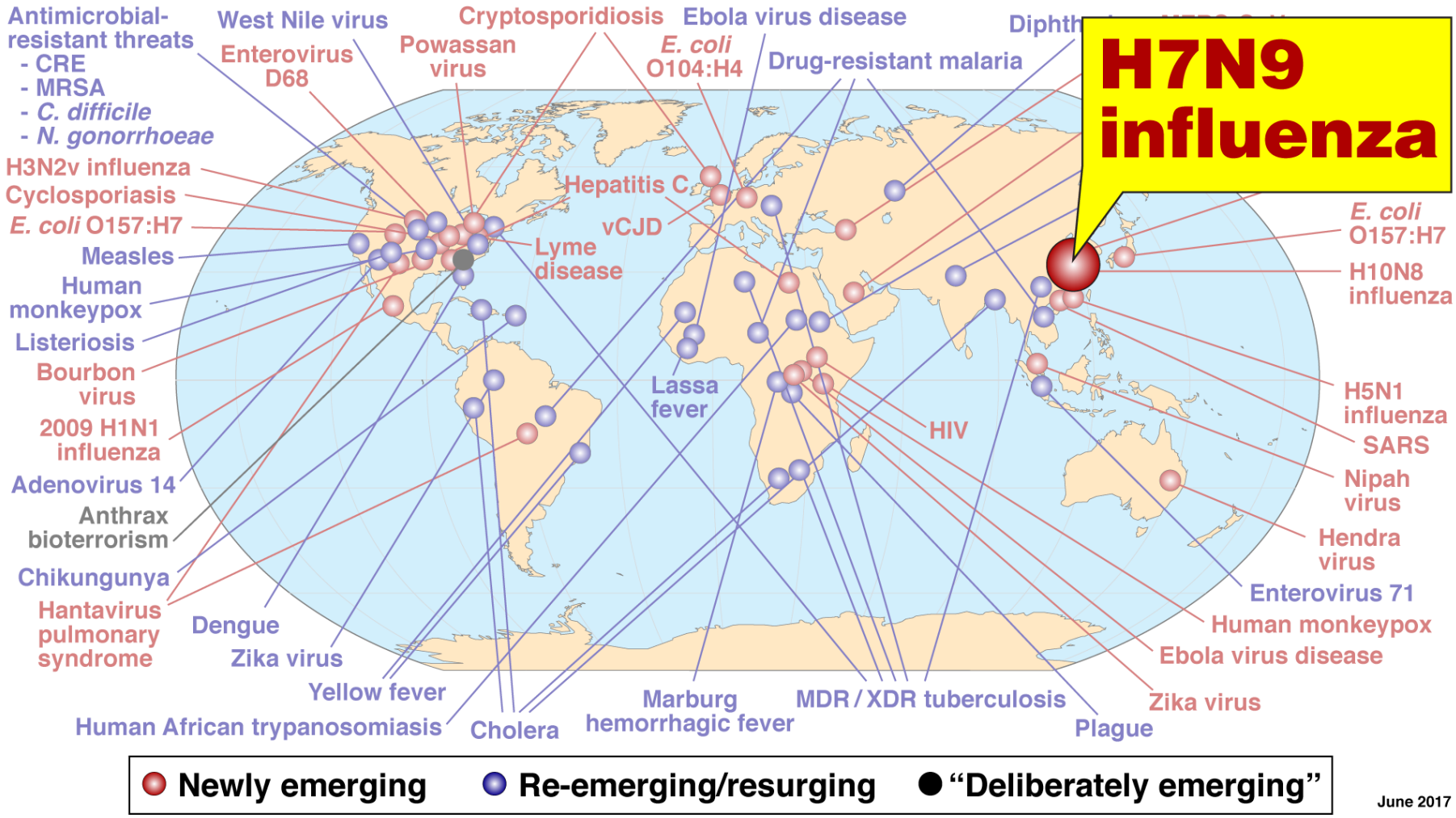
- VRC 705: A Phase 2/2b, Randomized, Placebo-Controlled Trial to Evaluate the Safety and Immunogenicity of a Zika Virus DNA Vaccine, VRC-ZKADNA085-00-VP

- 30+ sites in the US, Caribbean, Central and South America

Launched March 31, 2017

National Institute of Allergy and Infectious Diseases

Global Examples of Emerging and Re-Emerging Infectious Diseases



June 2017

National Institute of Allergy and Infectious Diseases

Phase 2 Trials of 2013 H7N9 Vaccine in Healthy Adults

October 8, 2014
Volume 312, Number 14
JAMA
The Journal of the American Medical Association

Serological Responses to an Avian Influenza A/H7N9 Vaccine Mixed at the Point-of-Use With MF59 Adjuvant

A Randomized Clinical Trial

MJ Mulligan, DI Bernstein, P Winokur et al

July 21, 2015
Volume 314, Number 3
JAMA
The Journal of the American Medical Association

Effect of Varying Doses of a Monovalent H7N9 Influenza Vaccine With and Without AS03 and MF59 Adjuvants on Immune Response

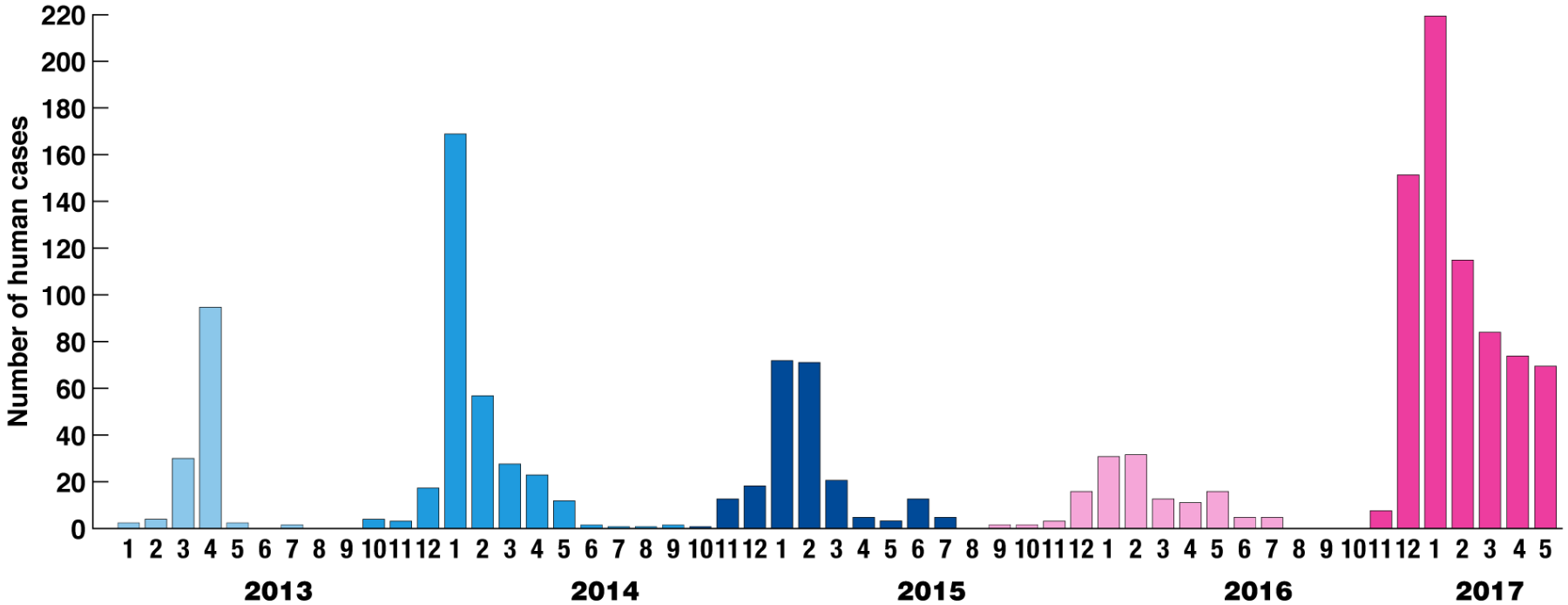
A Randomized Clinical Trial

LA Jackson, AR Bellamy et al

- ***Acceptable safety profile; two adjuvanted doses needed to induce adequate immune response***

Five Waves of Human H7N9 Influenza Infections in China, February 2013-present

- **1,532** confirmed human cases, **581** deaths
- 5th wave: >45% of cumulative cases



Source: FAO, 5/31/17

National Institute of Allergy and Infectious Diseases

NIAID H7N9 Influenza Proposed Vaccine Trials

- Phase 2 trials (several hundred volunteers) evaluating safety and immune response
  - Healthy Adults
  - Elderly
  - Children
  - Pregnant Women
  - Mix and Match (Vaccine from Company A + Adjuvant from Company B)
  - Concomitant with Seasonal (Adults)
  - Concomitant with Seasonal (Children)
- Trials would be conducted via the NIAID Vaccine and Treatment Evaluation Units (VTEUs)

On the Horizon:

New Ebola Outbreak in Democratic Republic of the Congo (DRC) April-June 2, 2017

- 7 cases (4 confirmed, 3 probable) and 4 deaths
- Bas-Uélé province, >1,300 kilometers from Kinshasa
- 8th Ebola virus disease outbreak in DRC since 1976

The New England Journal of Medicine
Established in 1812 as THE NEW ENGLAND JOURNAL OF MEDICINE AND SURGERY
VOLUME 376 APRIL 13, 2017 NUMBER 15

Yellow Fever — Once Again on the Radar Screen in the Americas

CI Paules and AS Fauci

NIAID Strategic Plan 2017

Priorities in 5 major areas:

- Infectious diseases (non-AIDS), including emerging and re-emerging diseases and biodefense
- HIV/AIDS
- Allergy, immunology, and immune-mediated diseases
- Global Health
- Essential foundations for the future
  - research resources and infrastructure, training, communications/outreach

Questions

National Institute of Allergy and Infectious Diseases