

# How to Succeed as a Clinician Scientist in the Year 2009 and Beyond

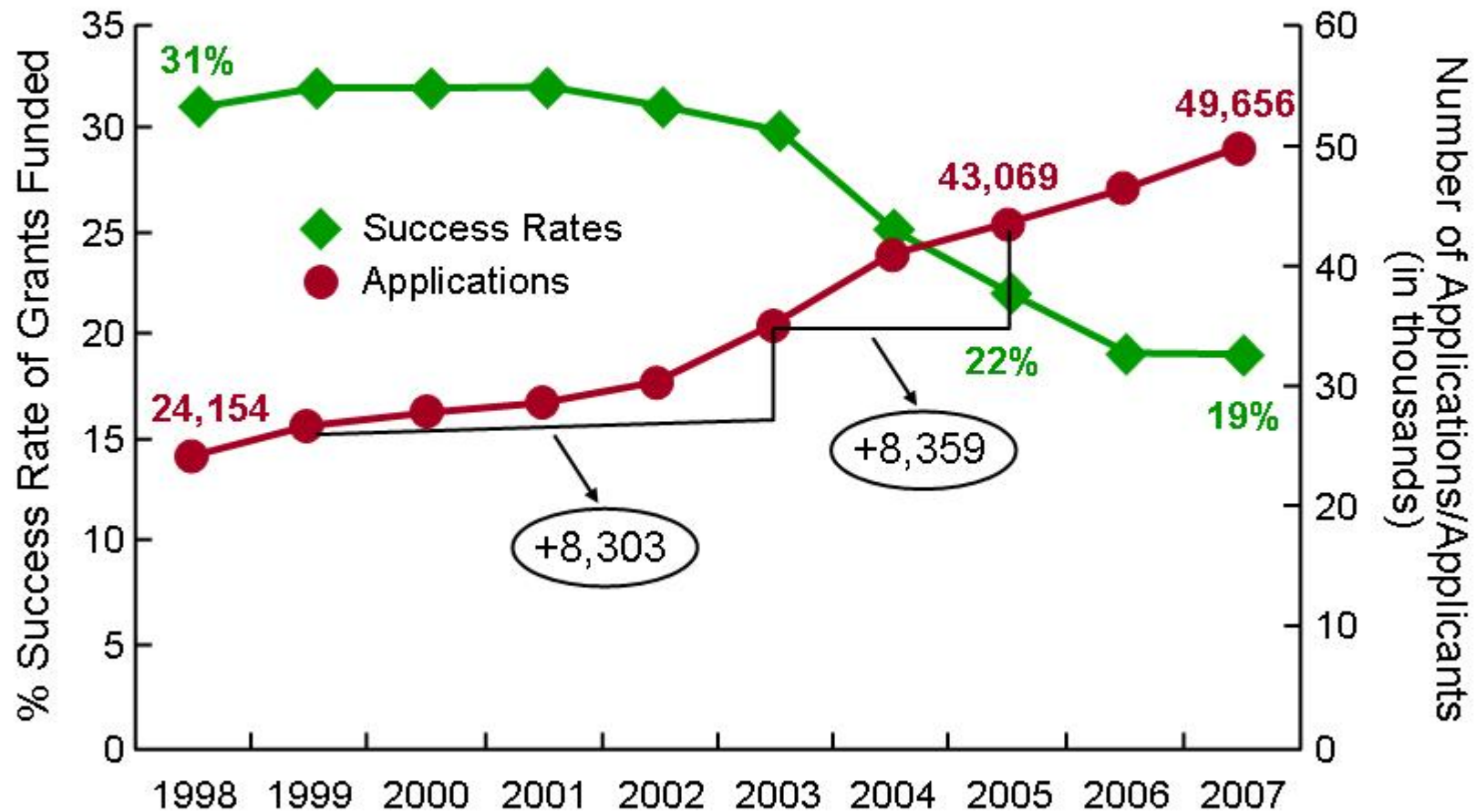
Andrew I. Schafer

Chairman, Department of Medicine

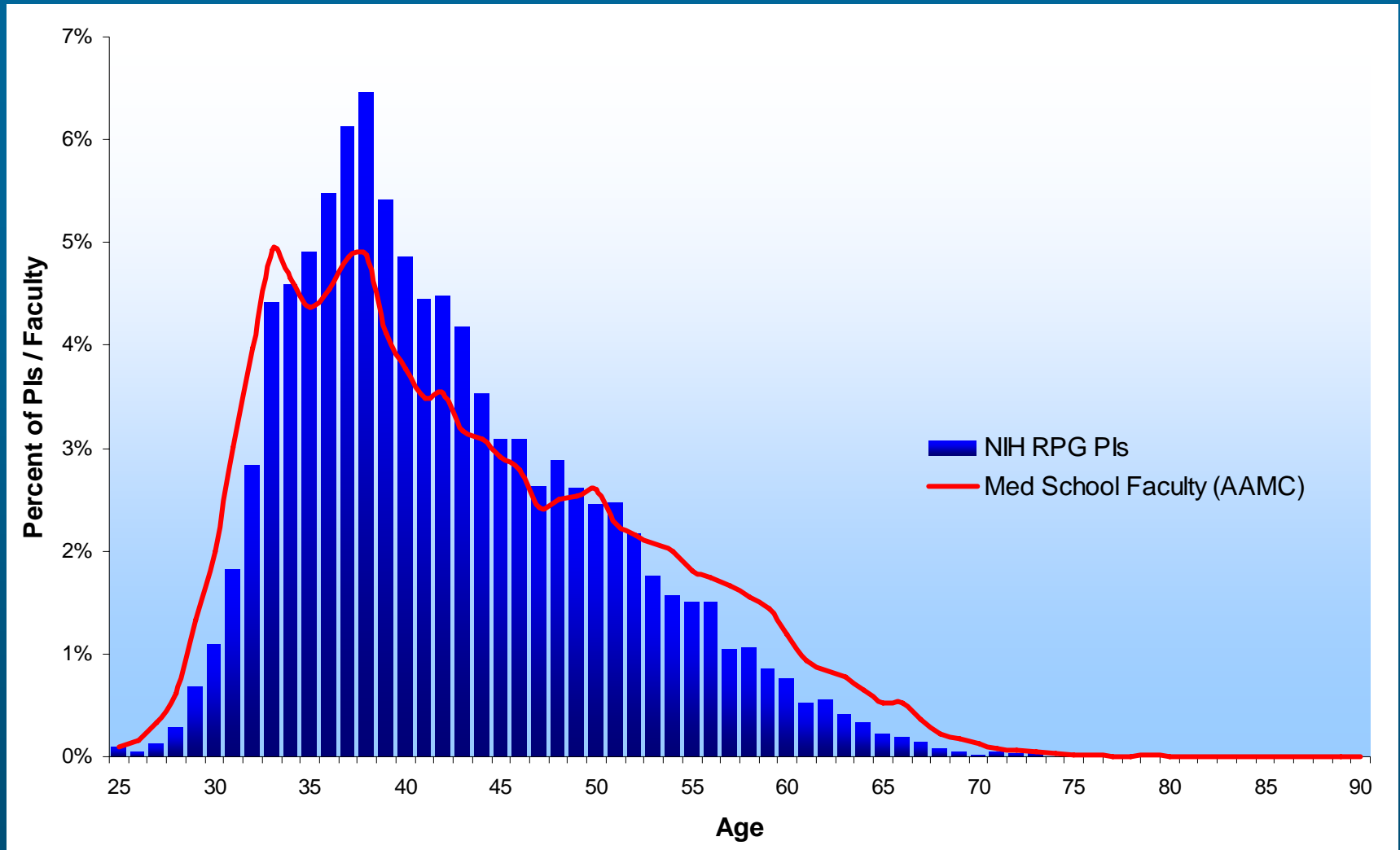
Weill Cornell Medical College

# National Research Capacity and Demand for Grants

## Surges at End of Doubling Period: Success Rates Fall

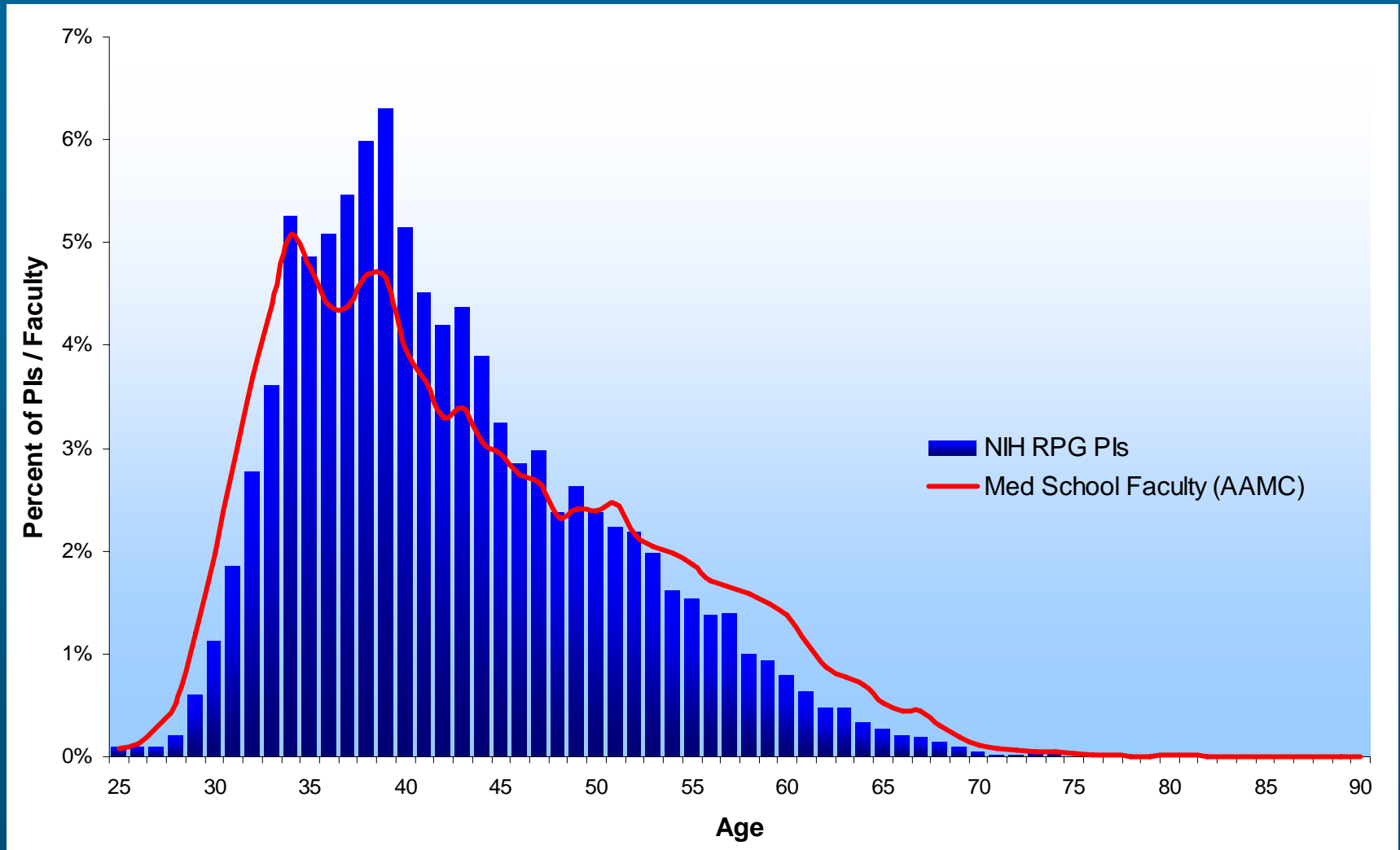


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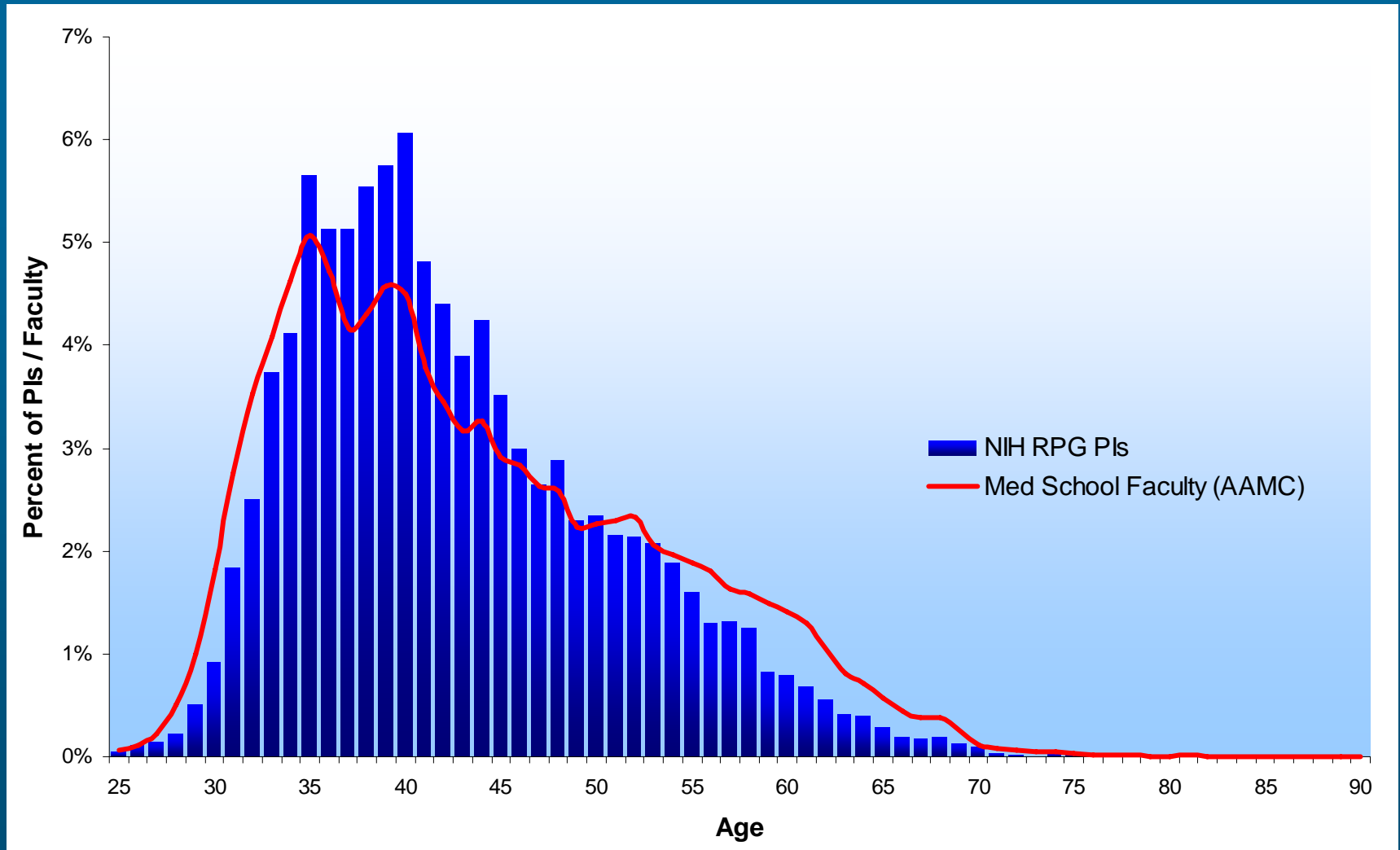
Sources: IMPAC II Current and History Files and AAMC Faculty Roster

# 1981



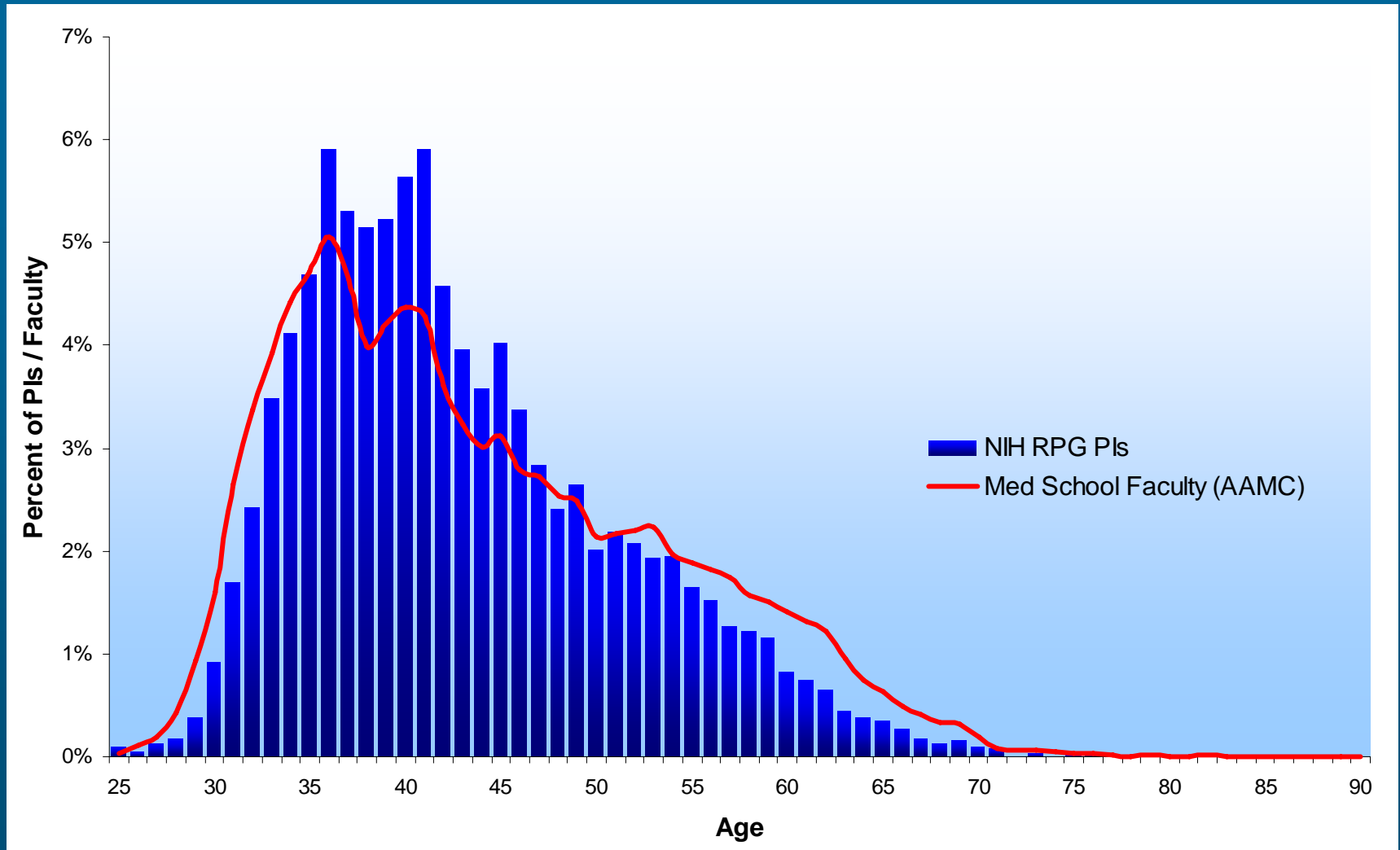
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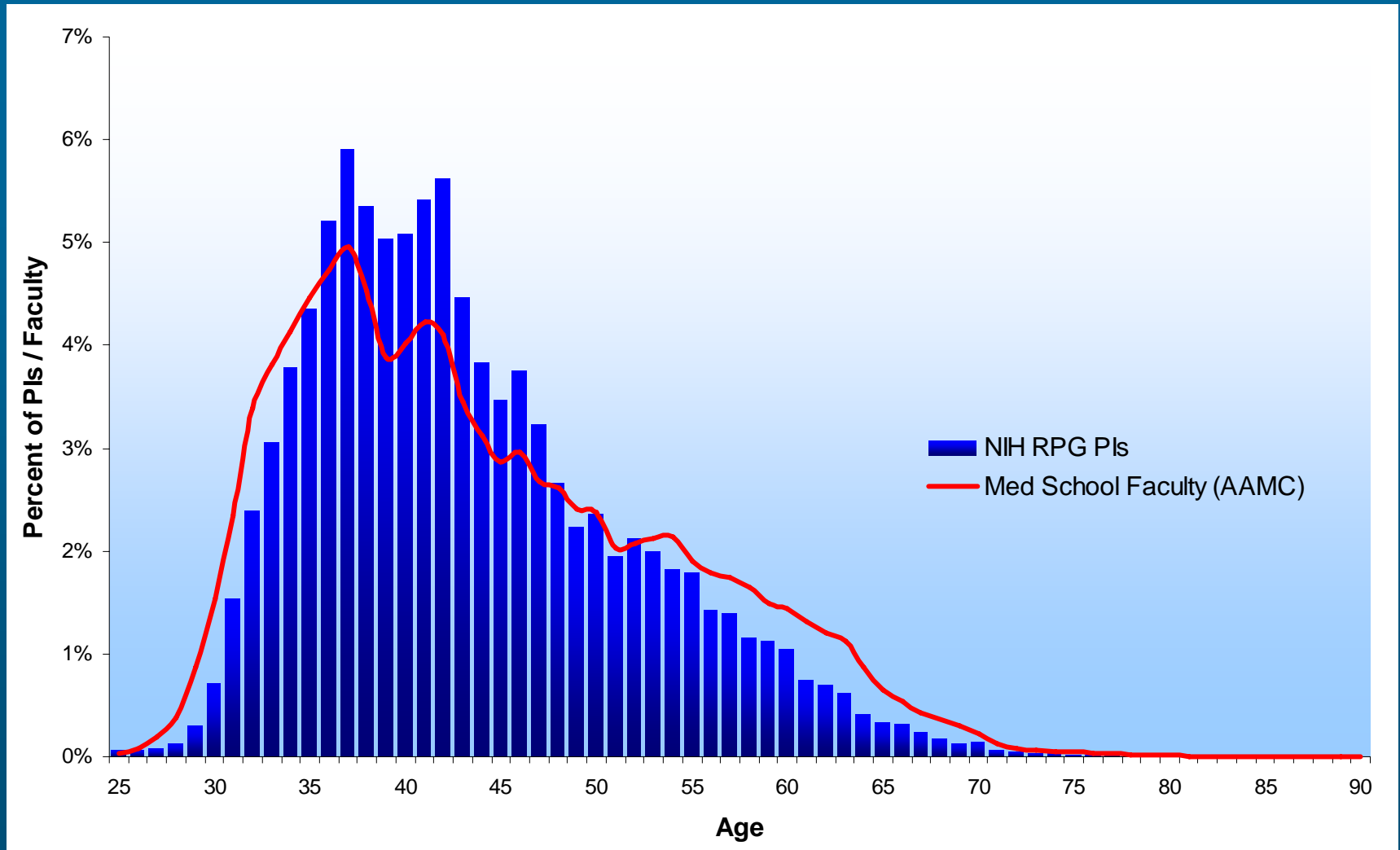
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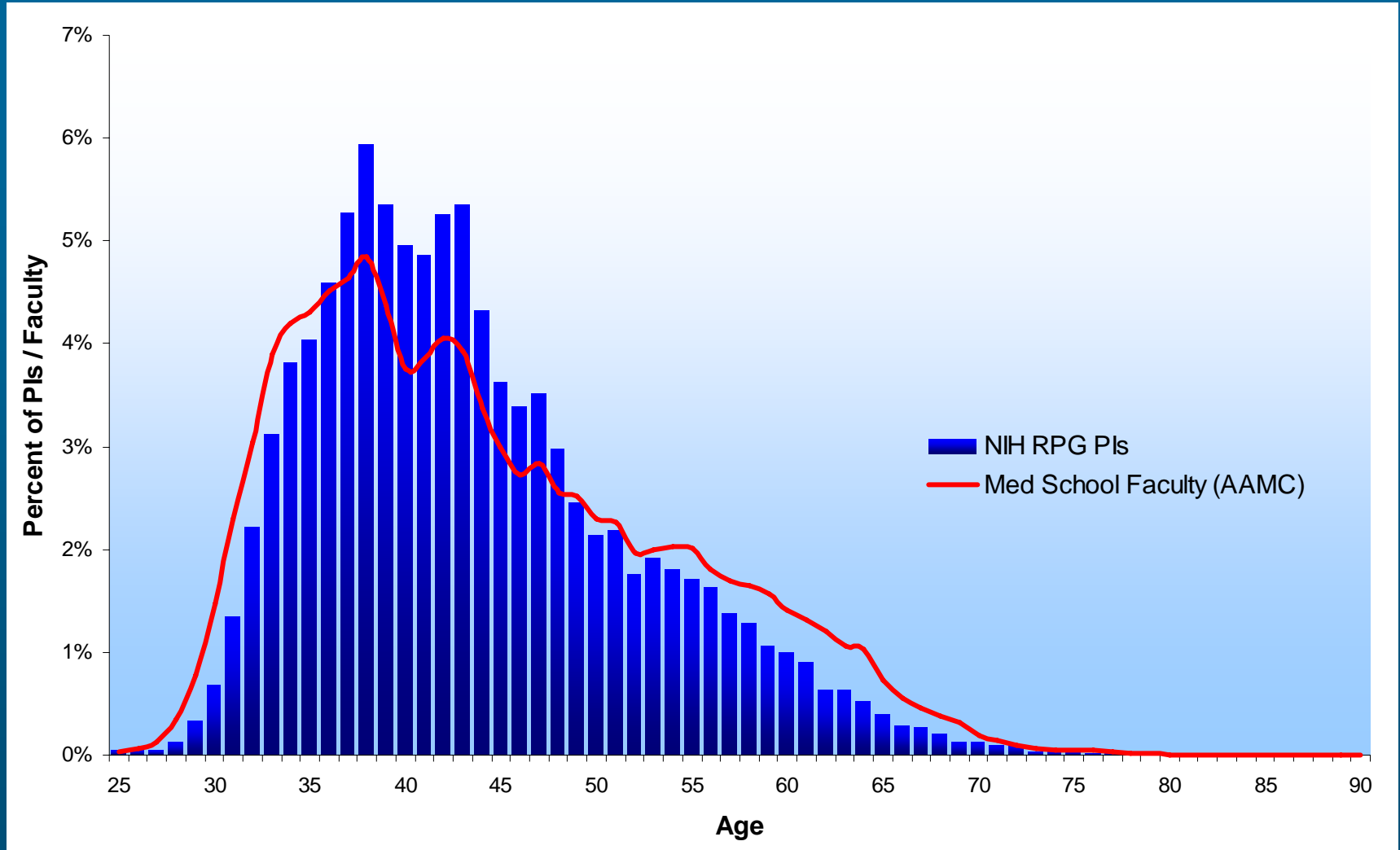
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# 1984



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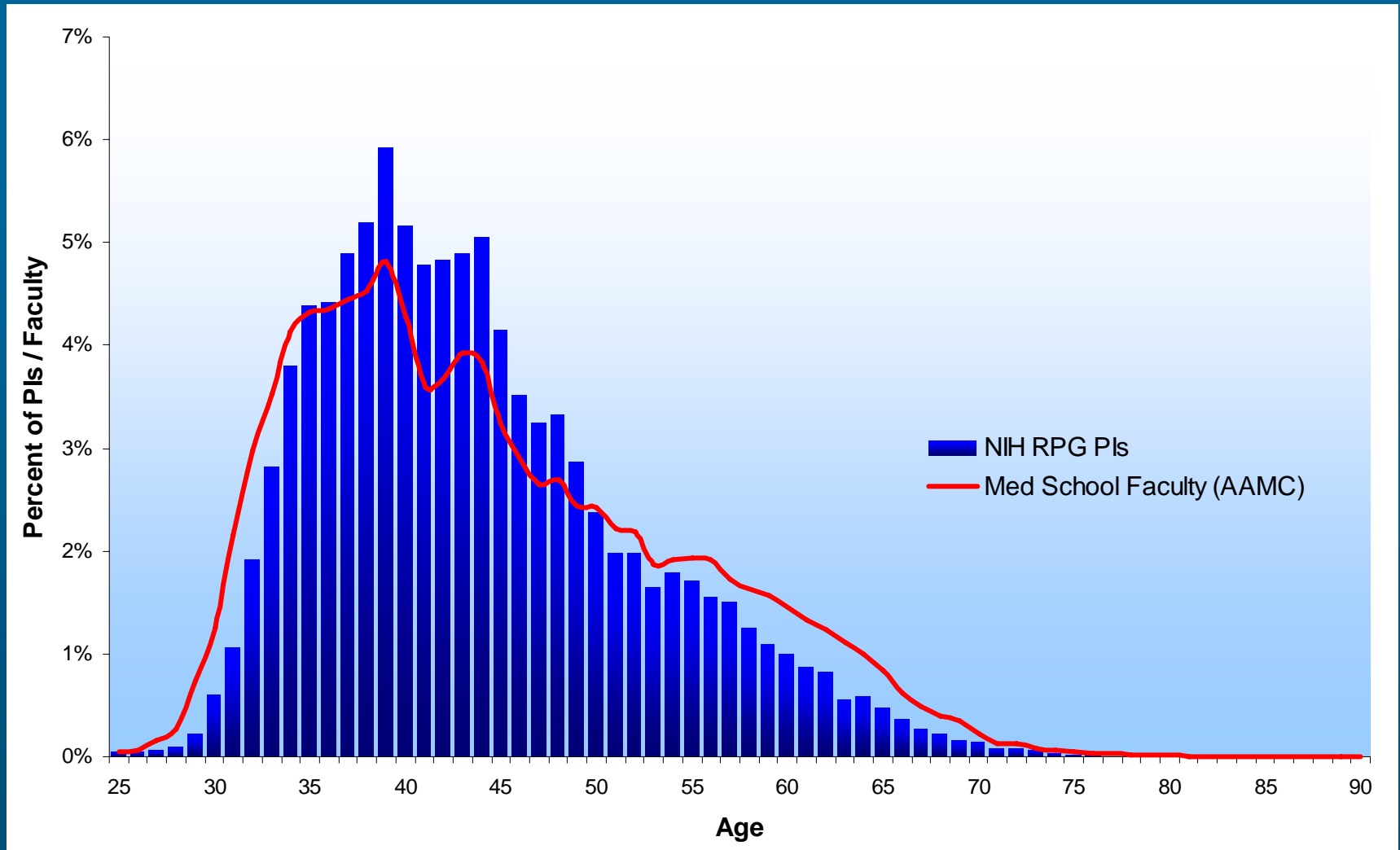
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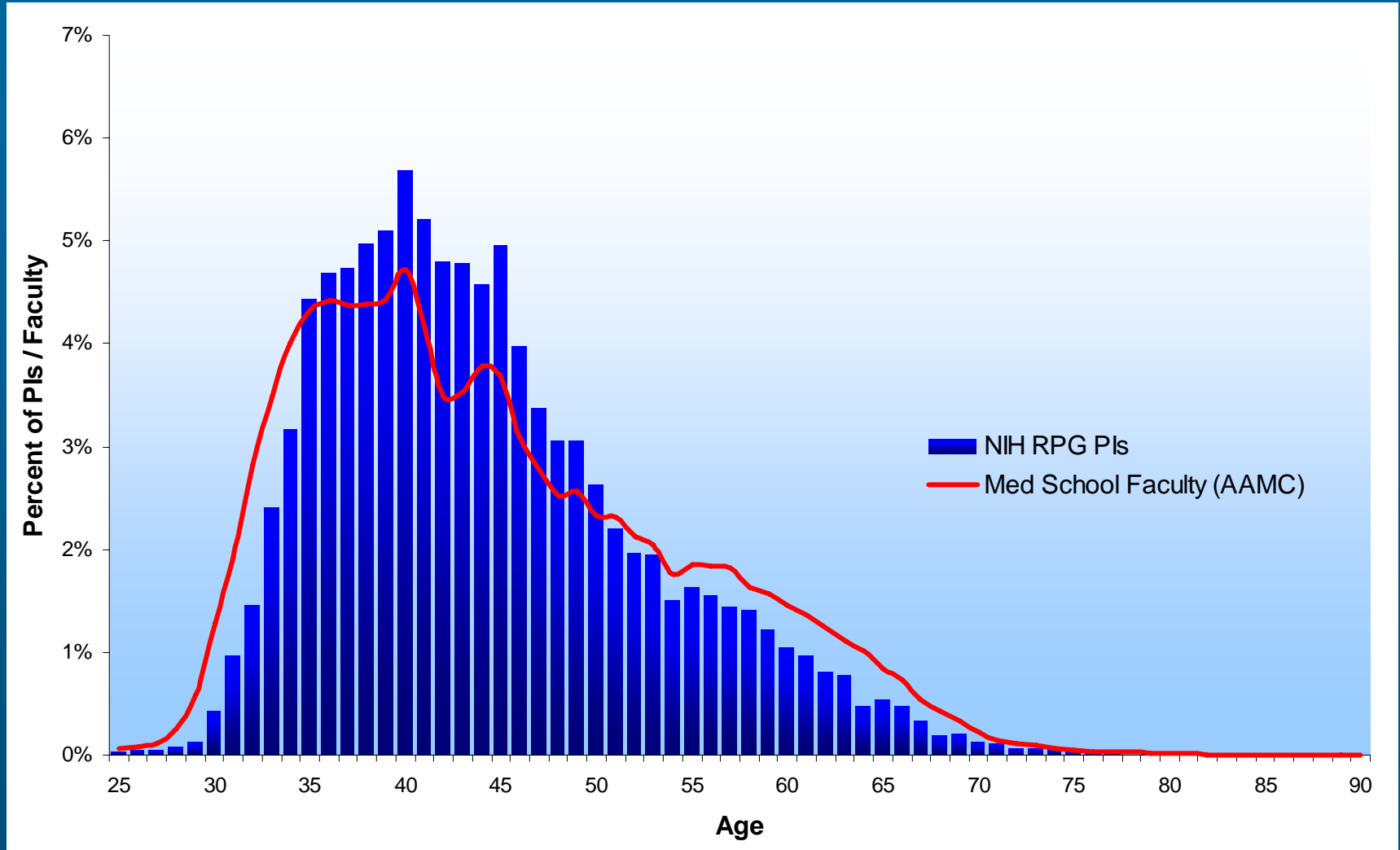


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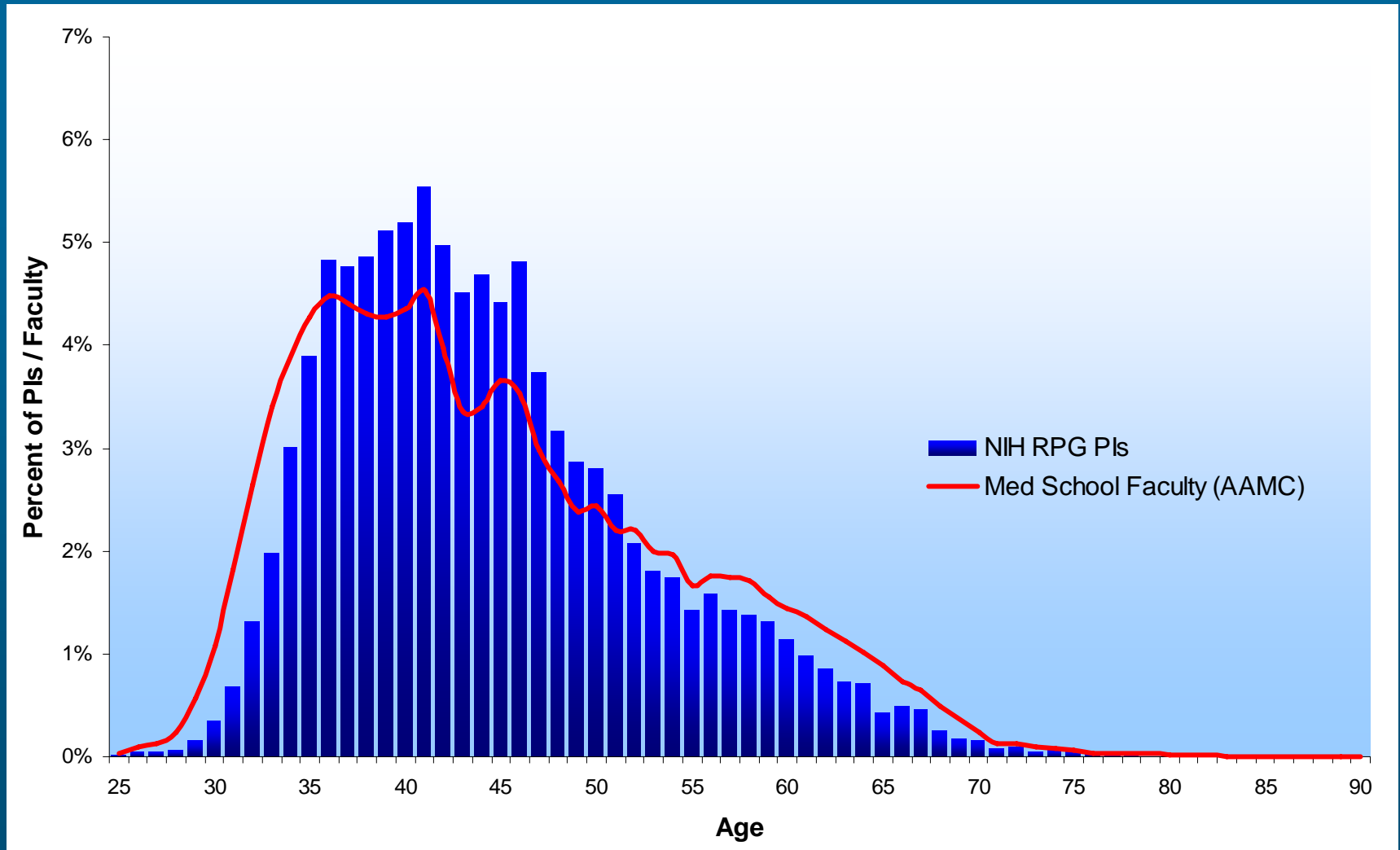
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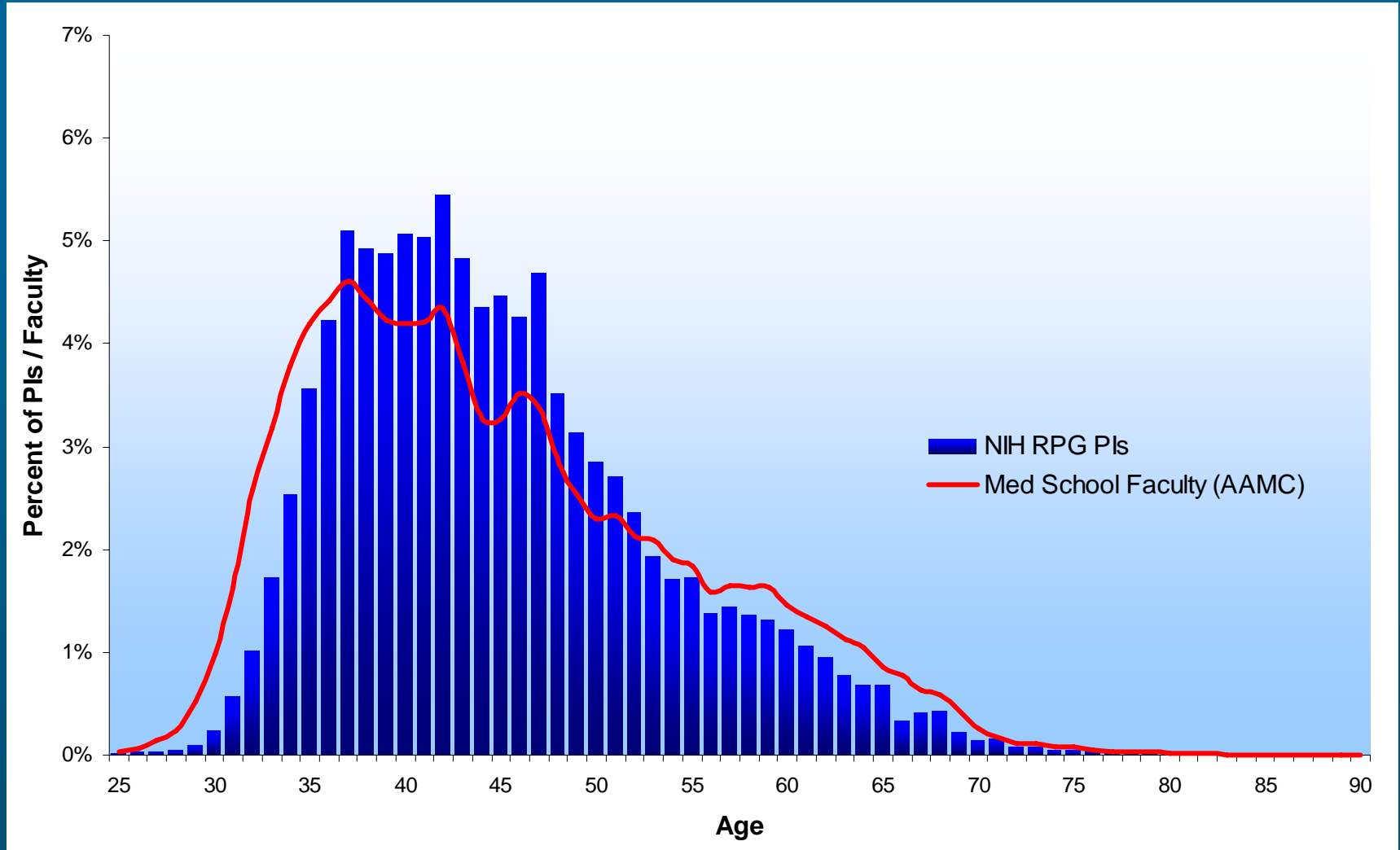
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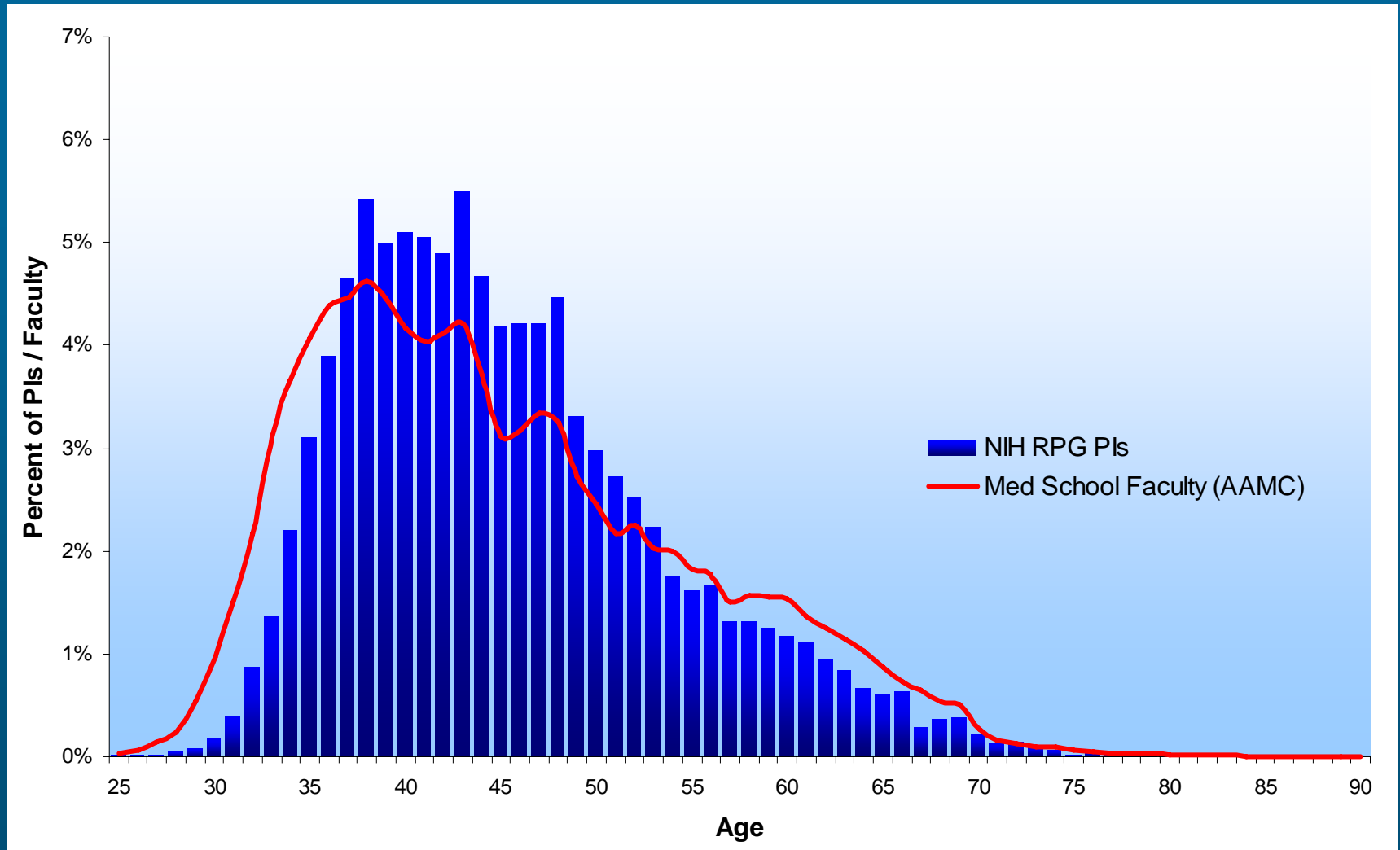
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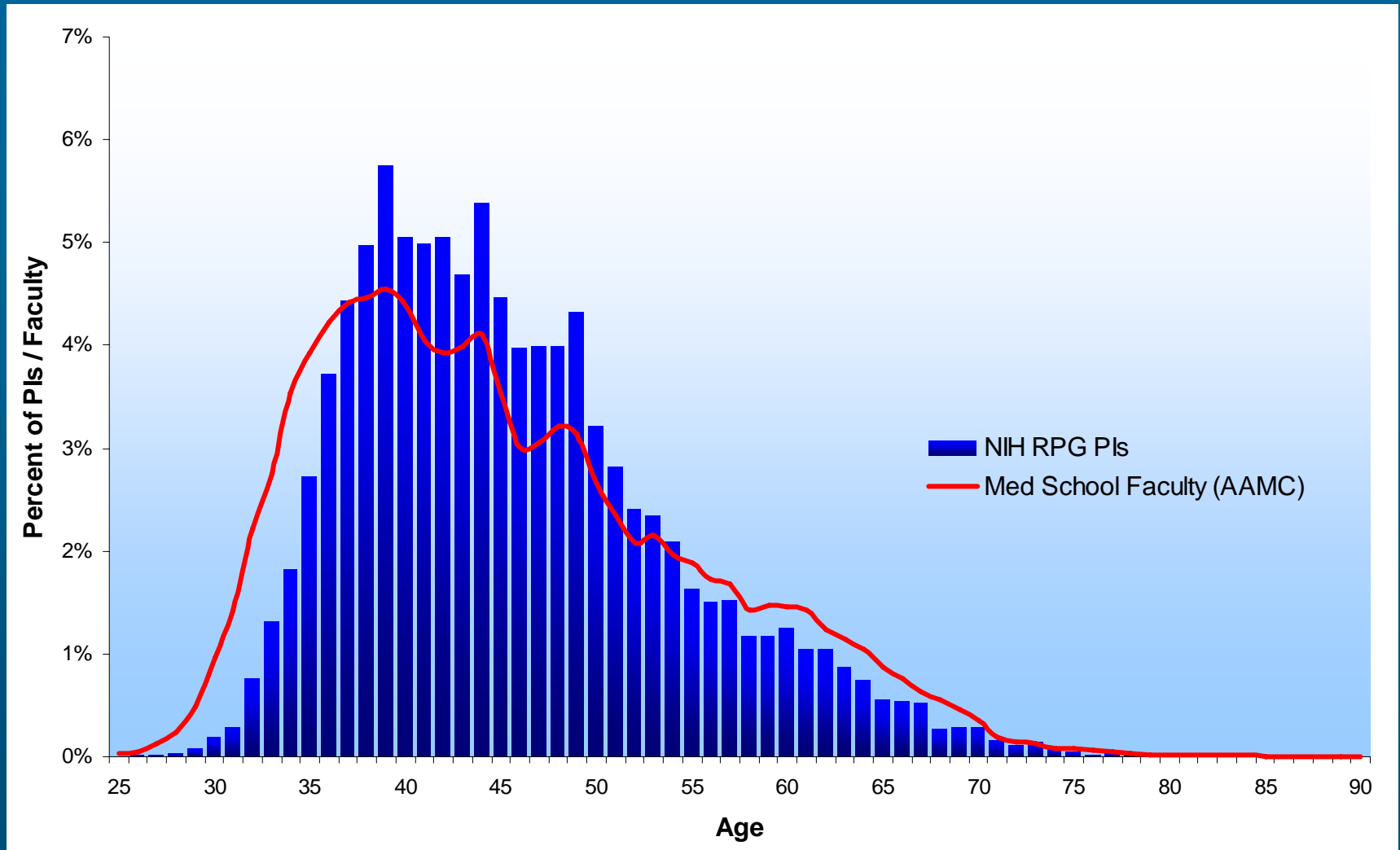
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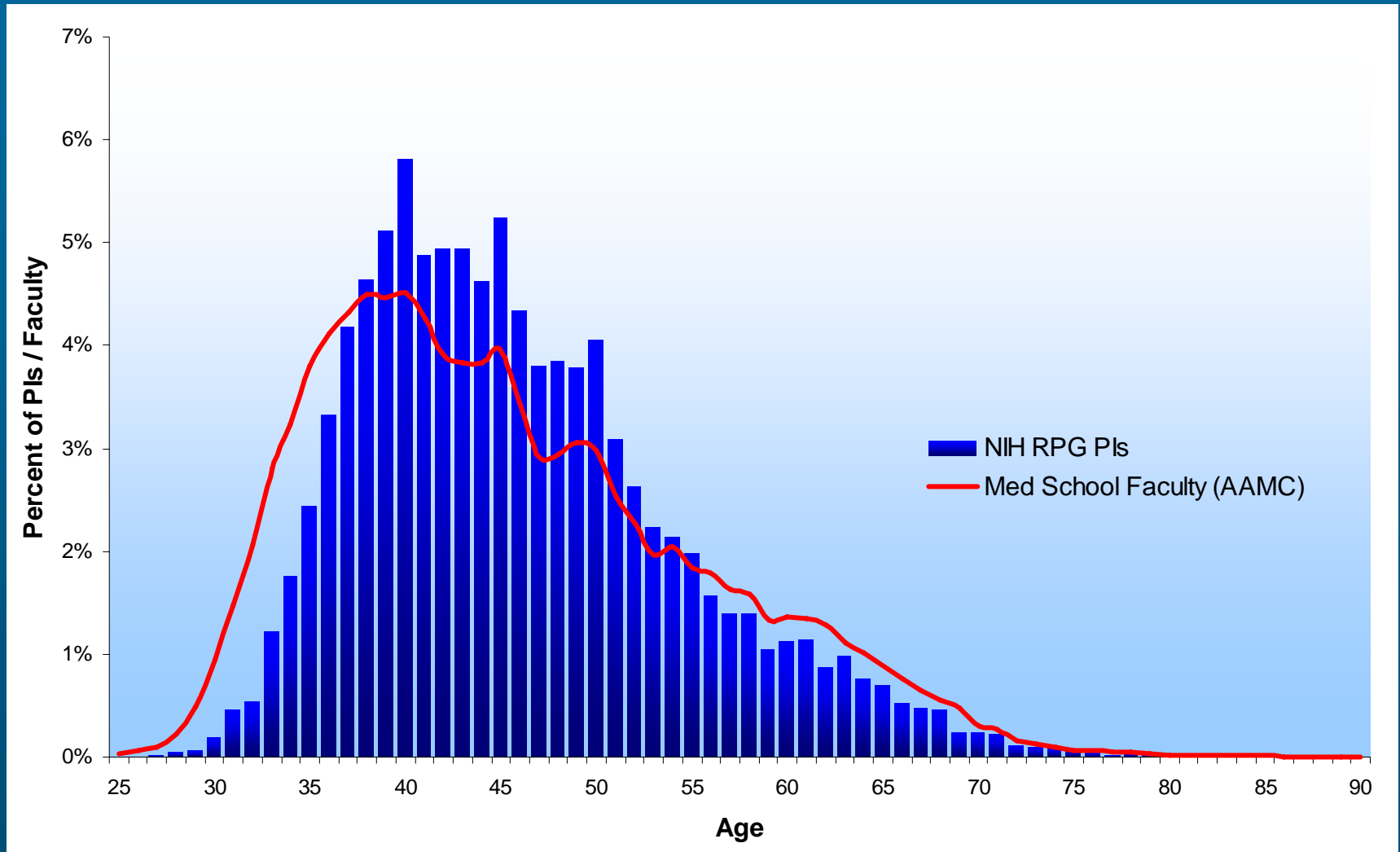
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# 1991



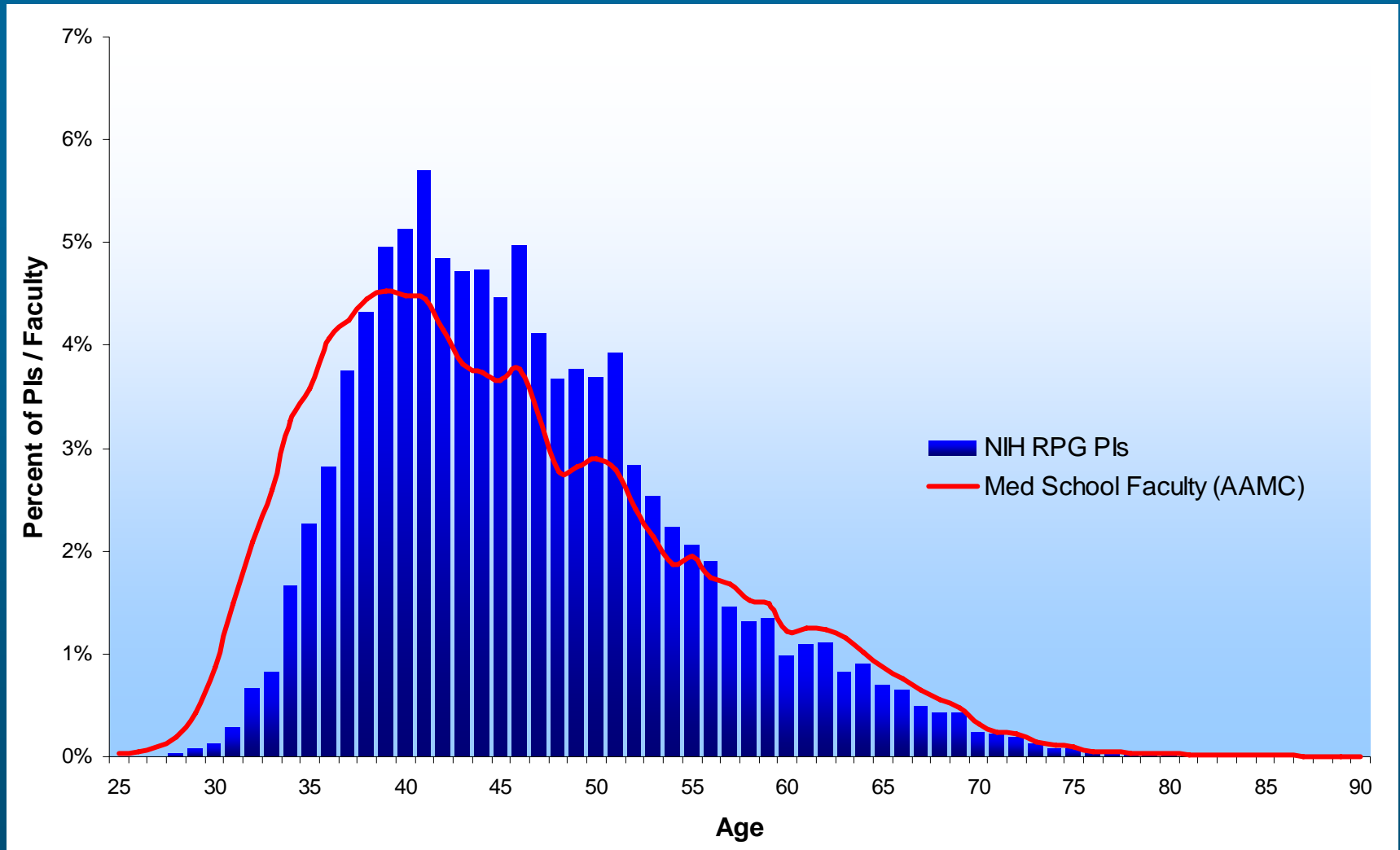
Sources: IMPAC II Current and History Files and AAMC Faculty Roster

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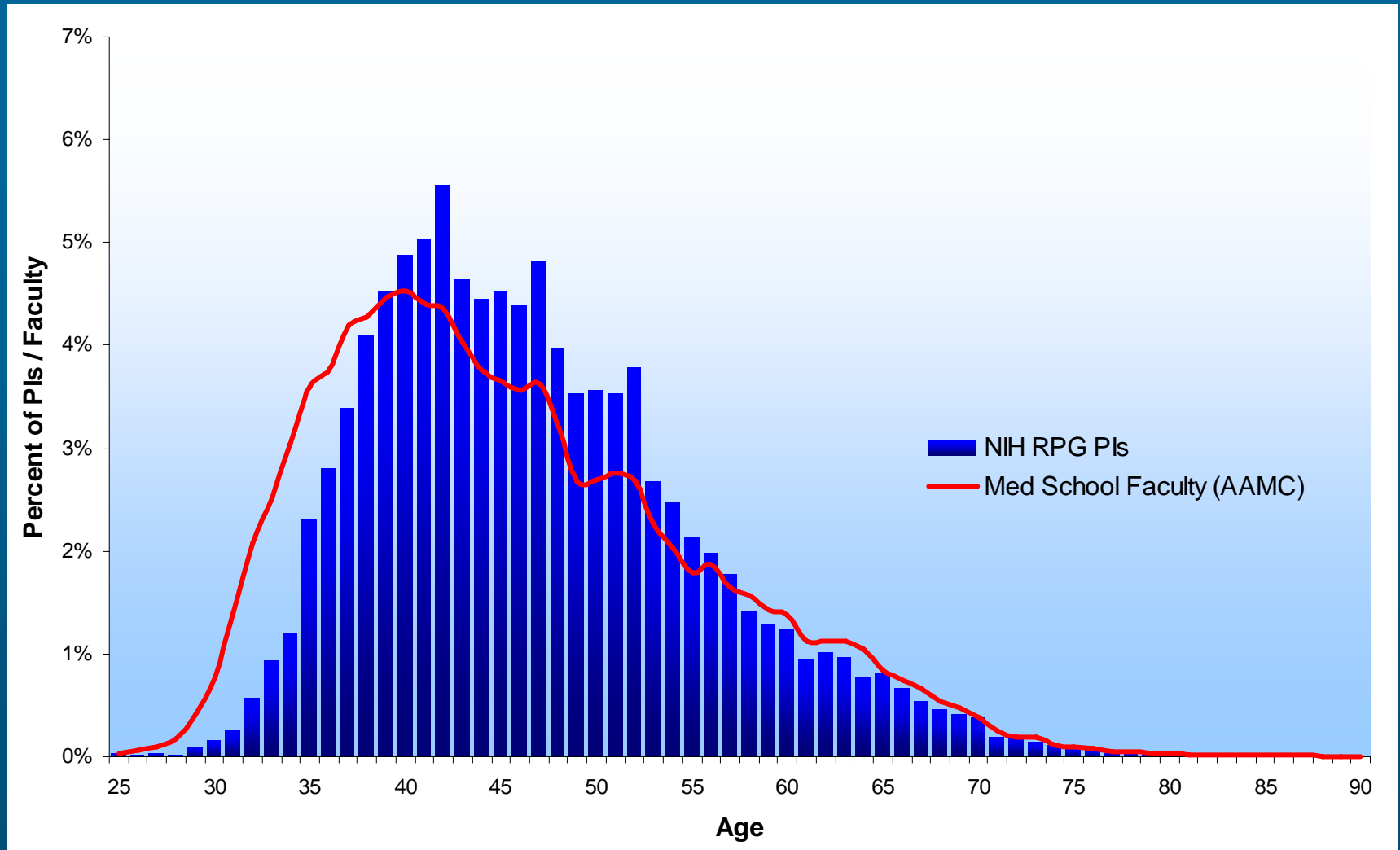
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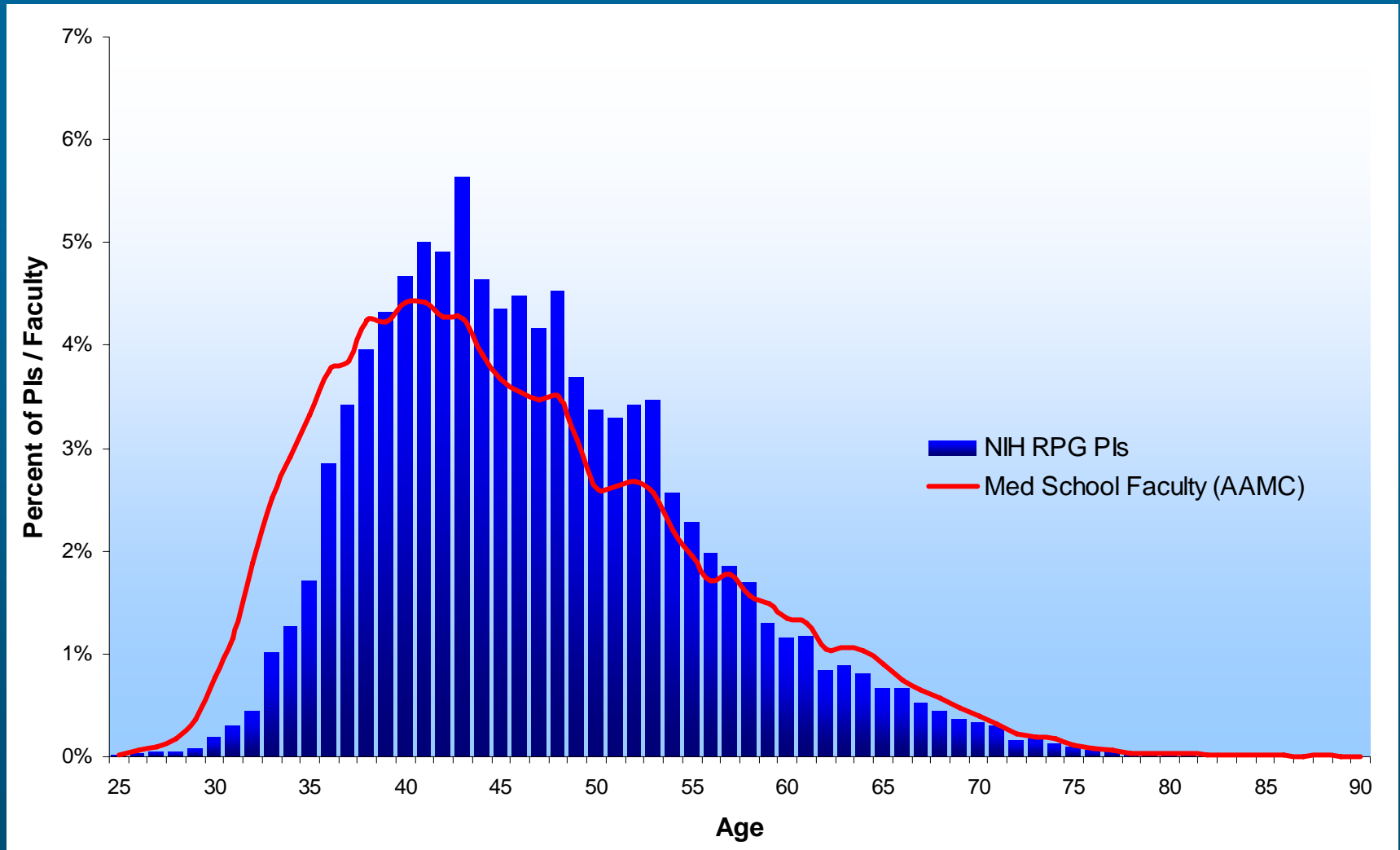


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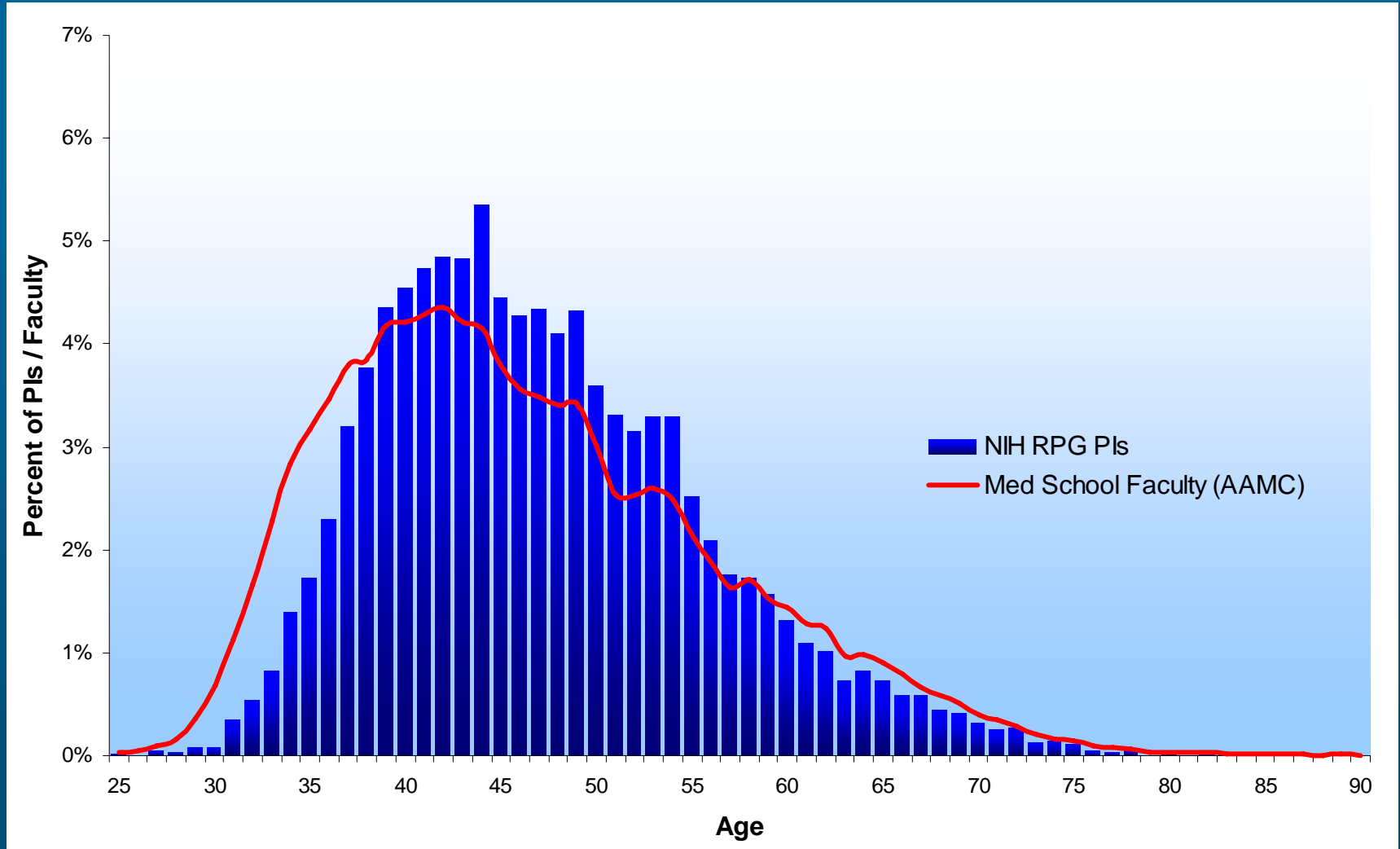
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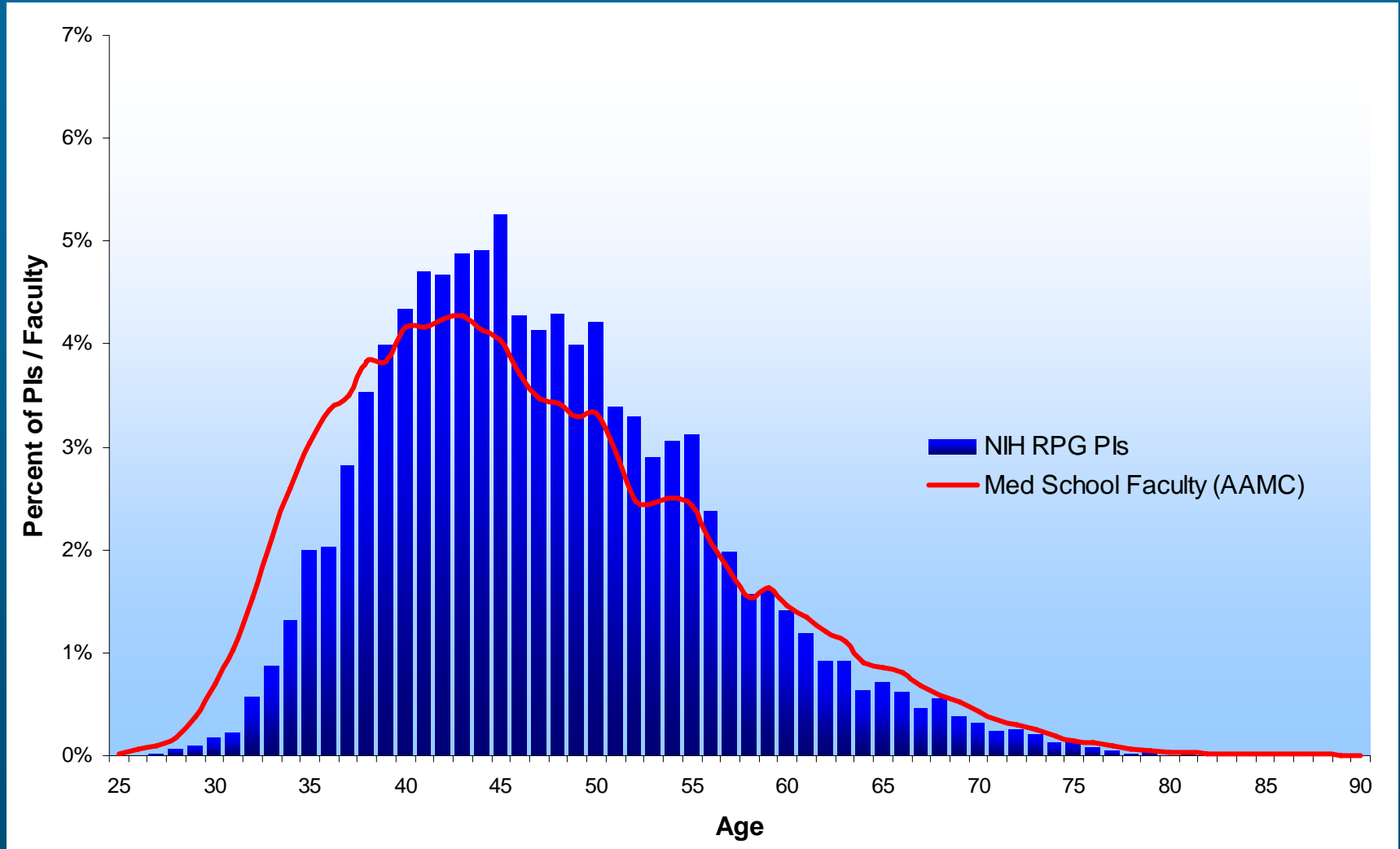
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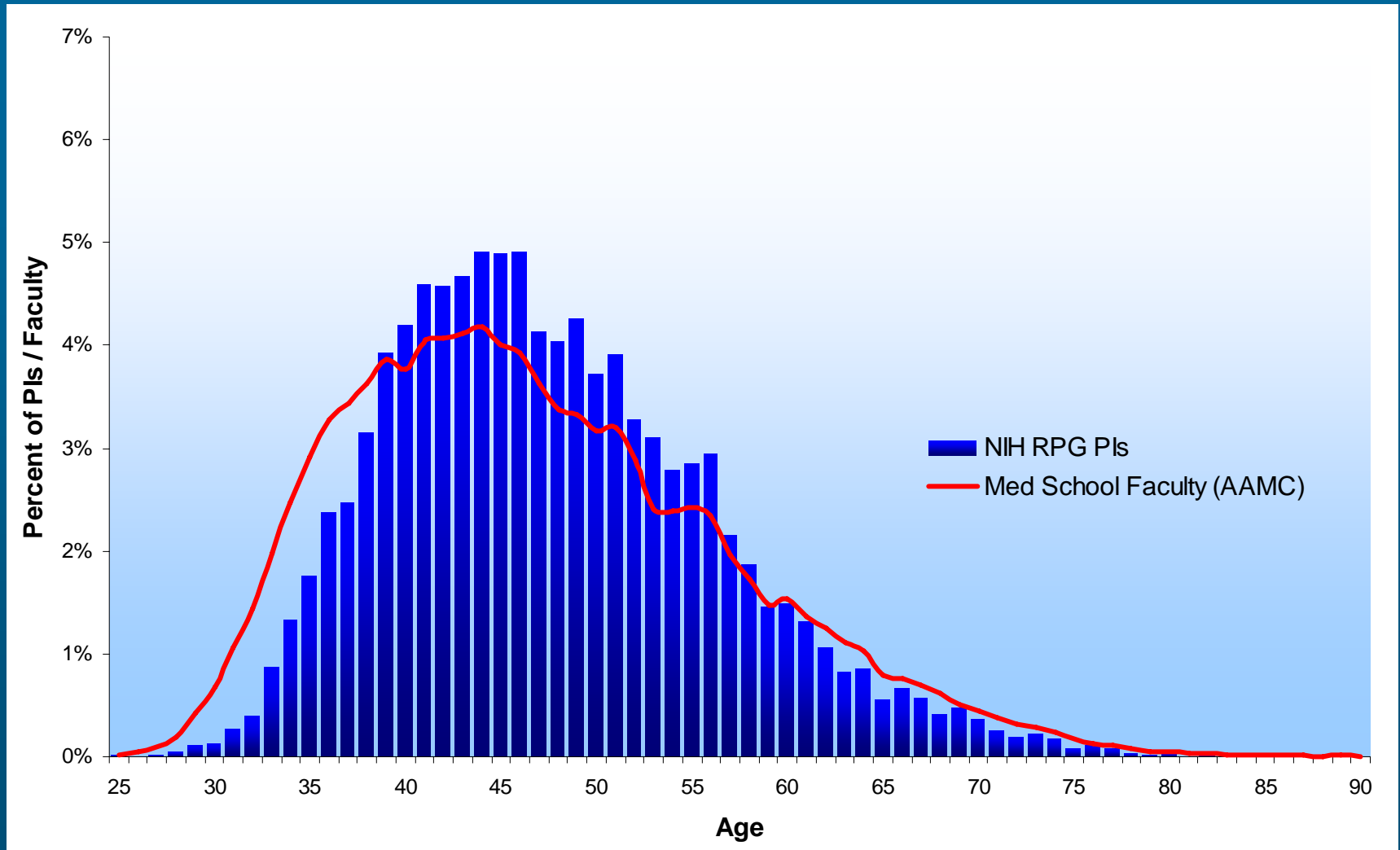
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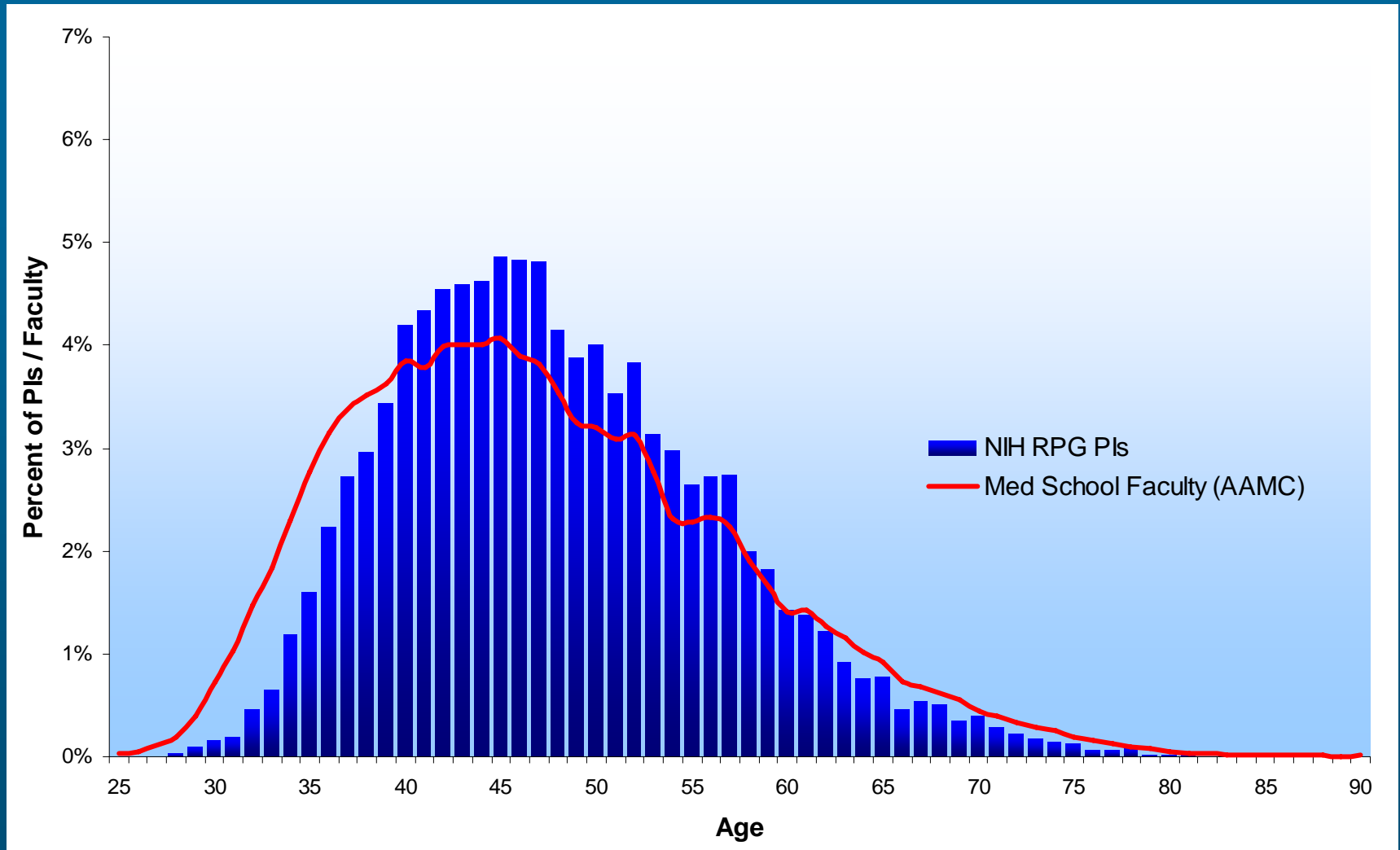
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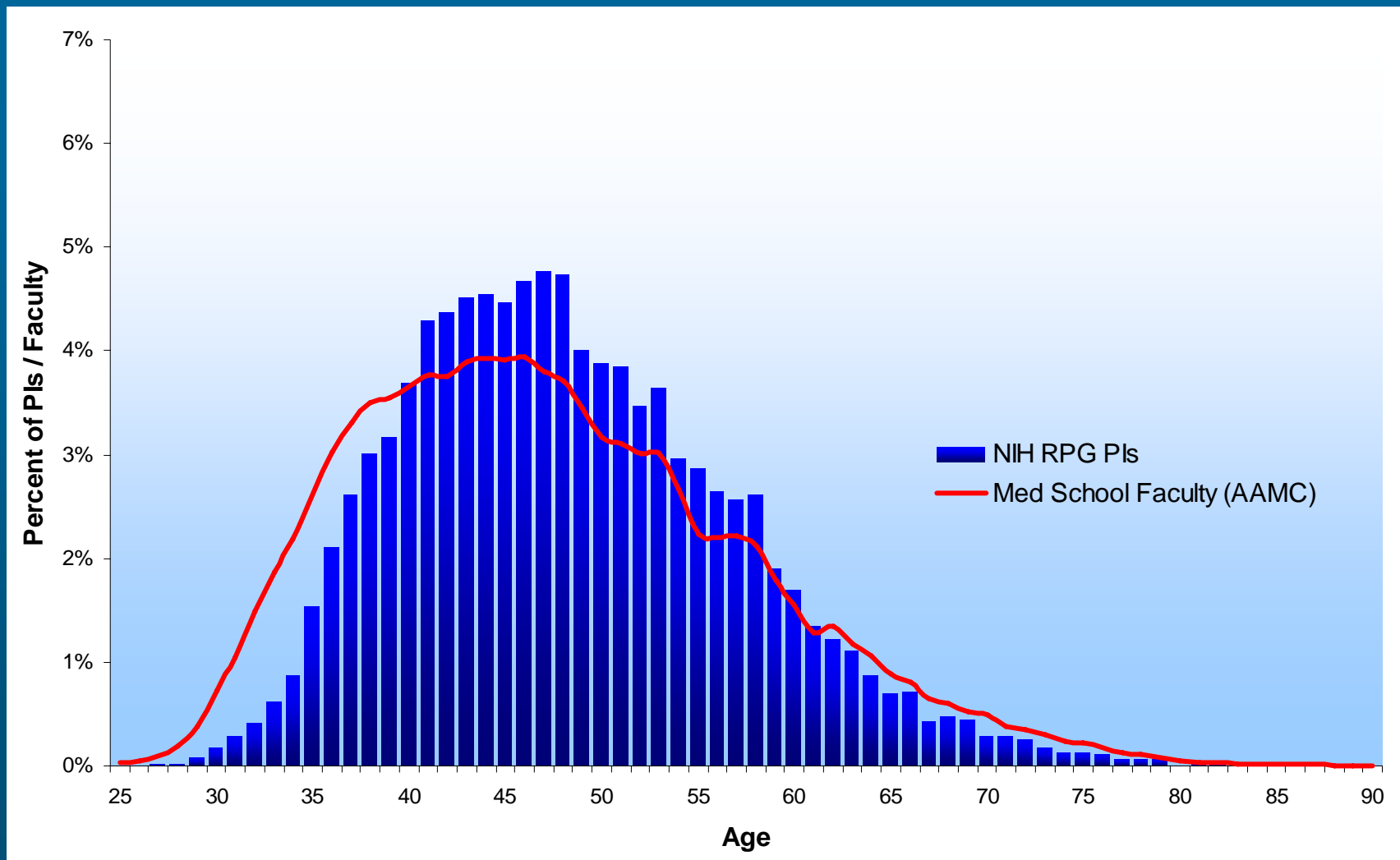
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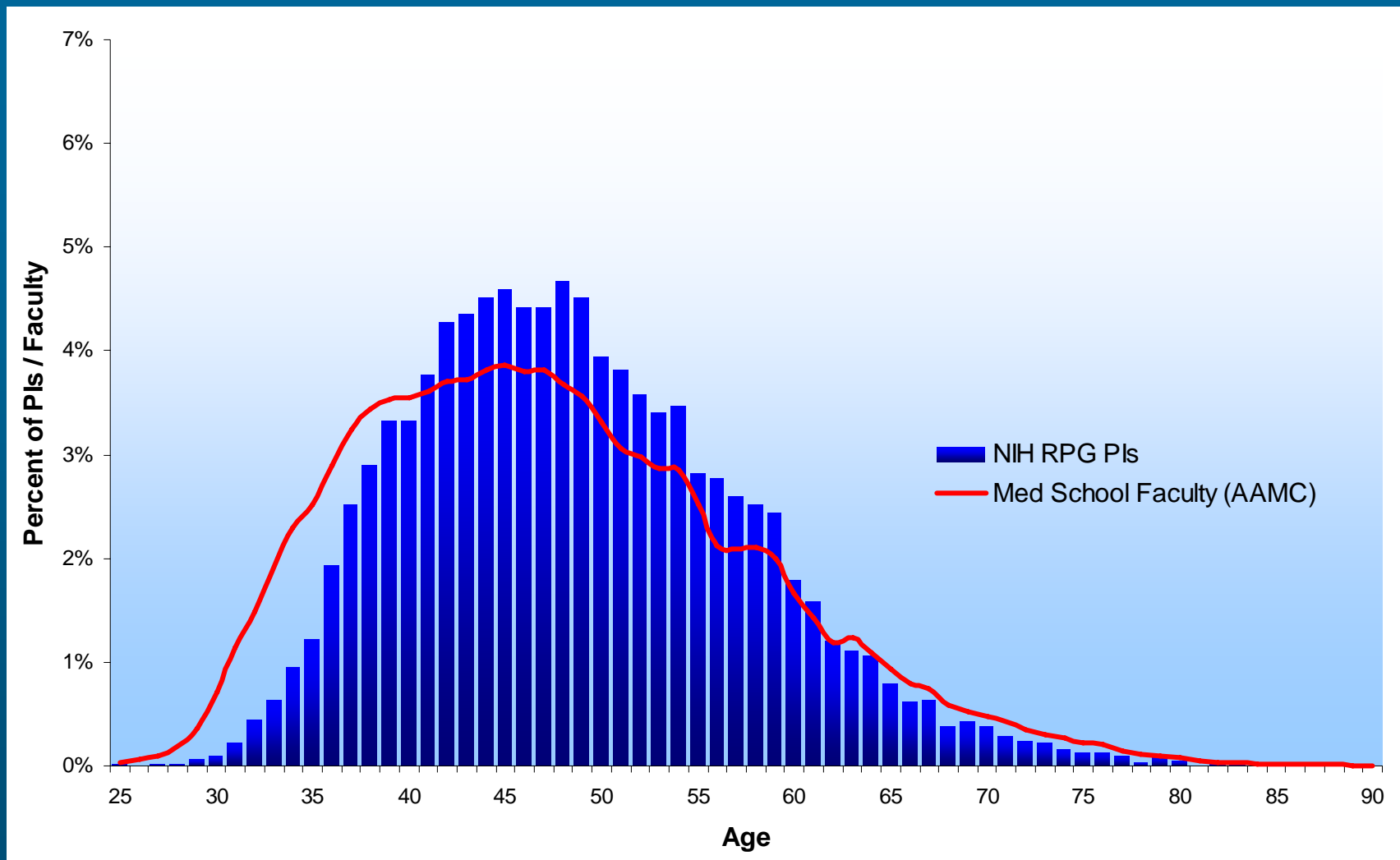
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# 2000



Sources: IMPAC II Current and History Files and AAMC Faculty Roster

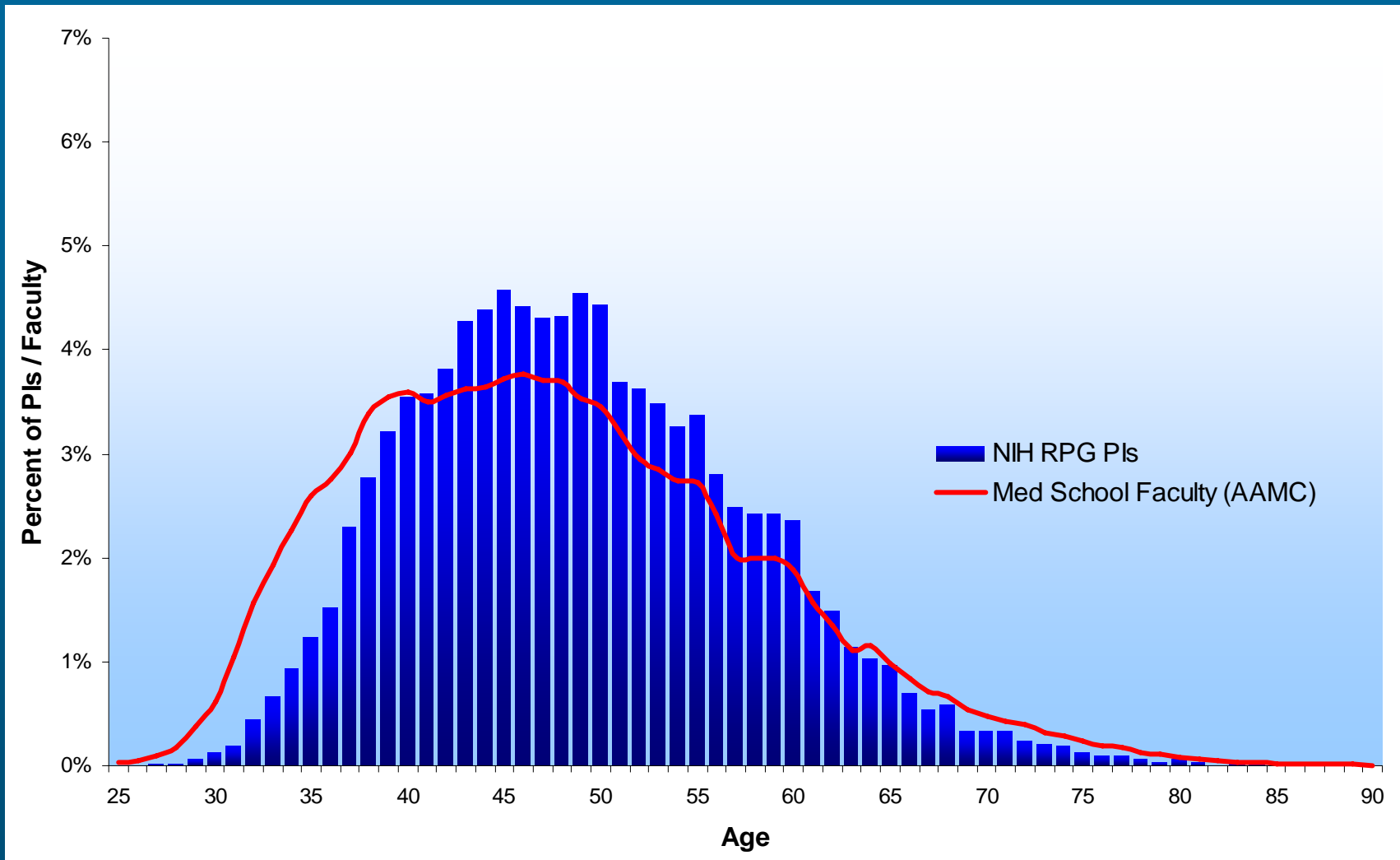
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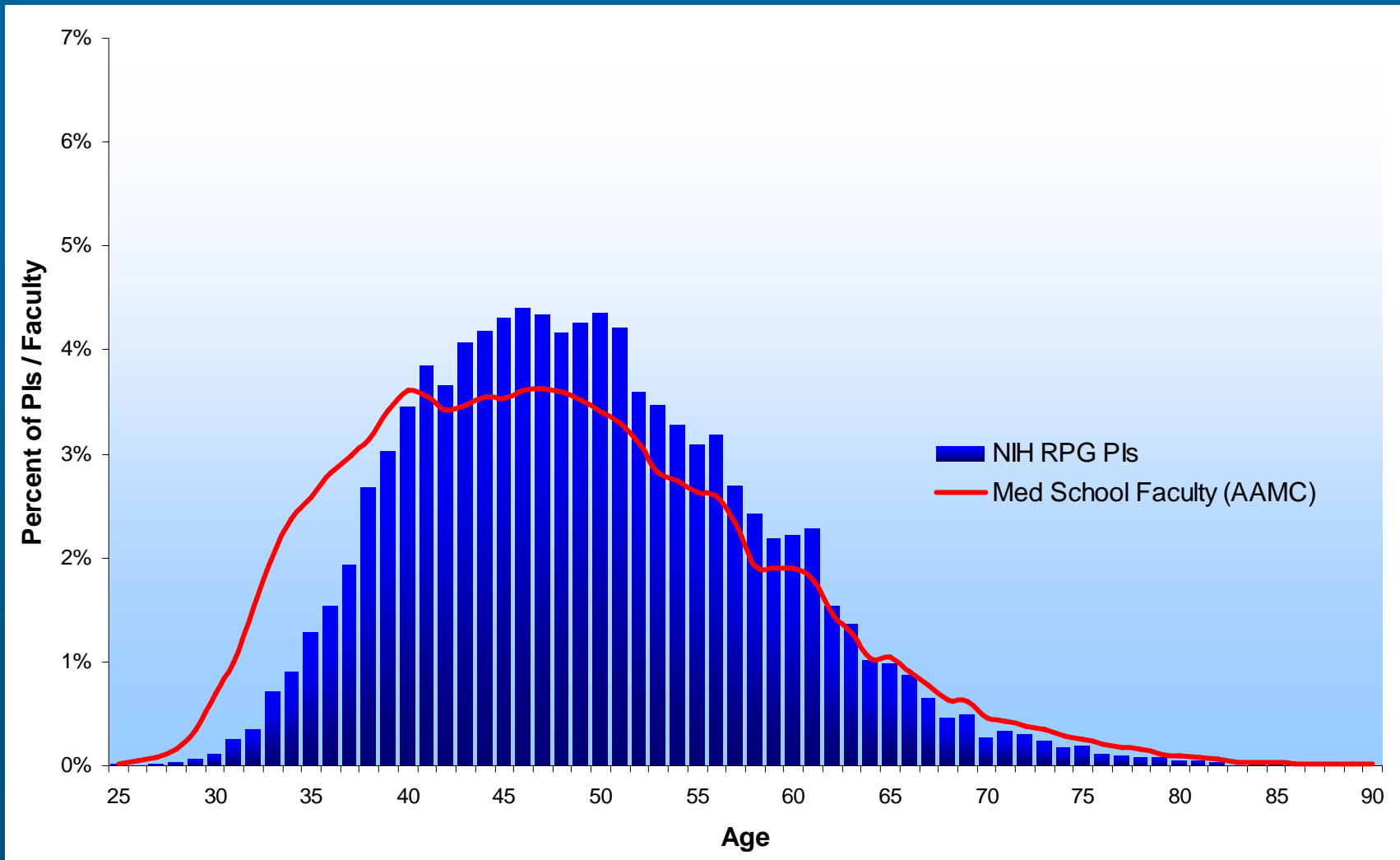


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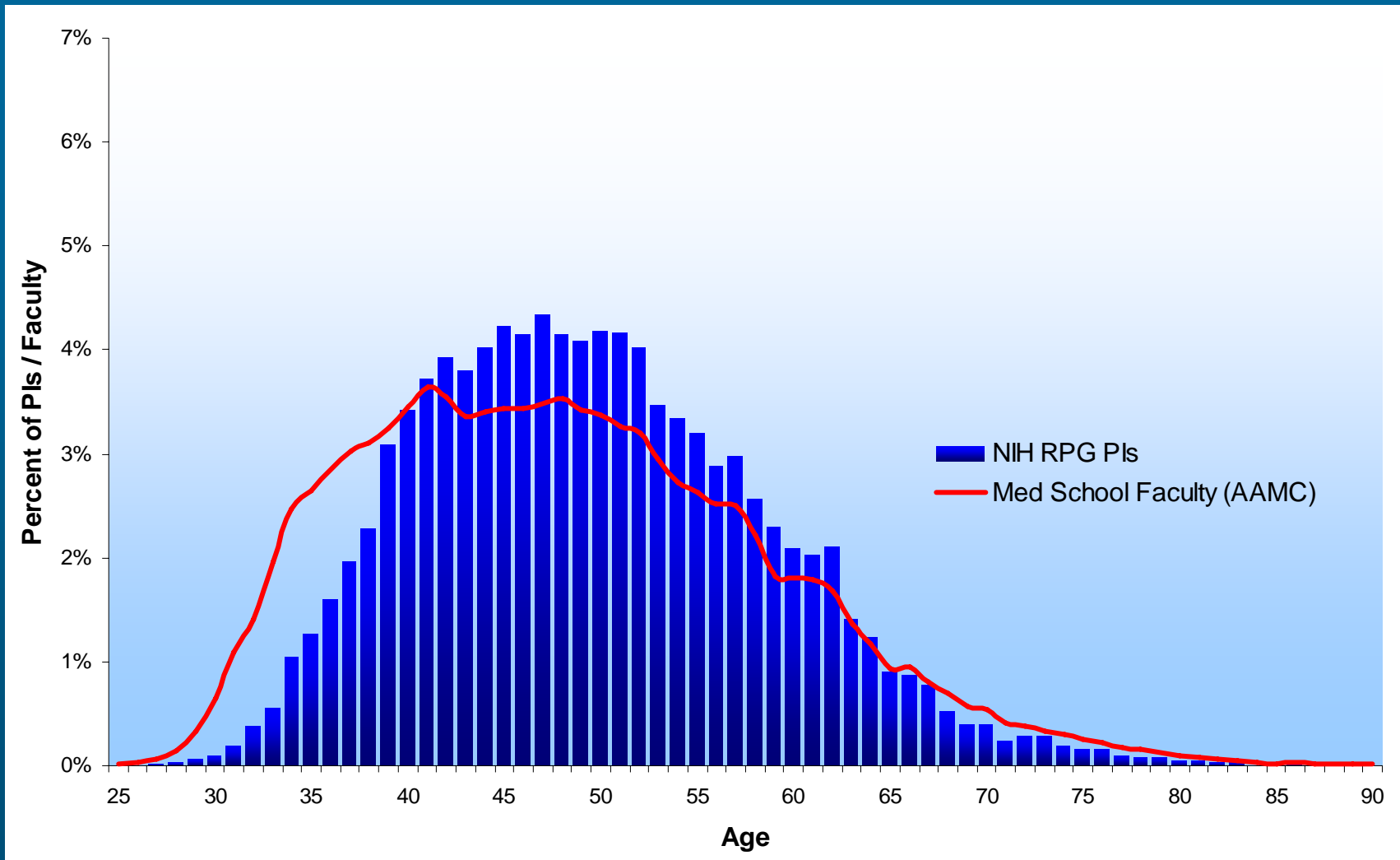
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# 2003



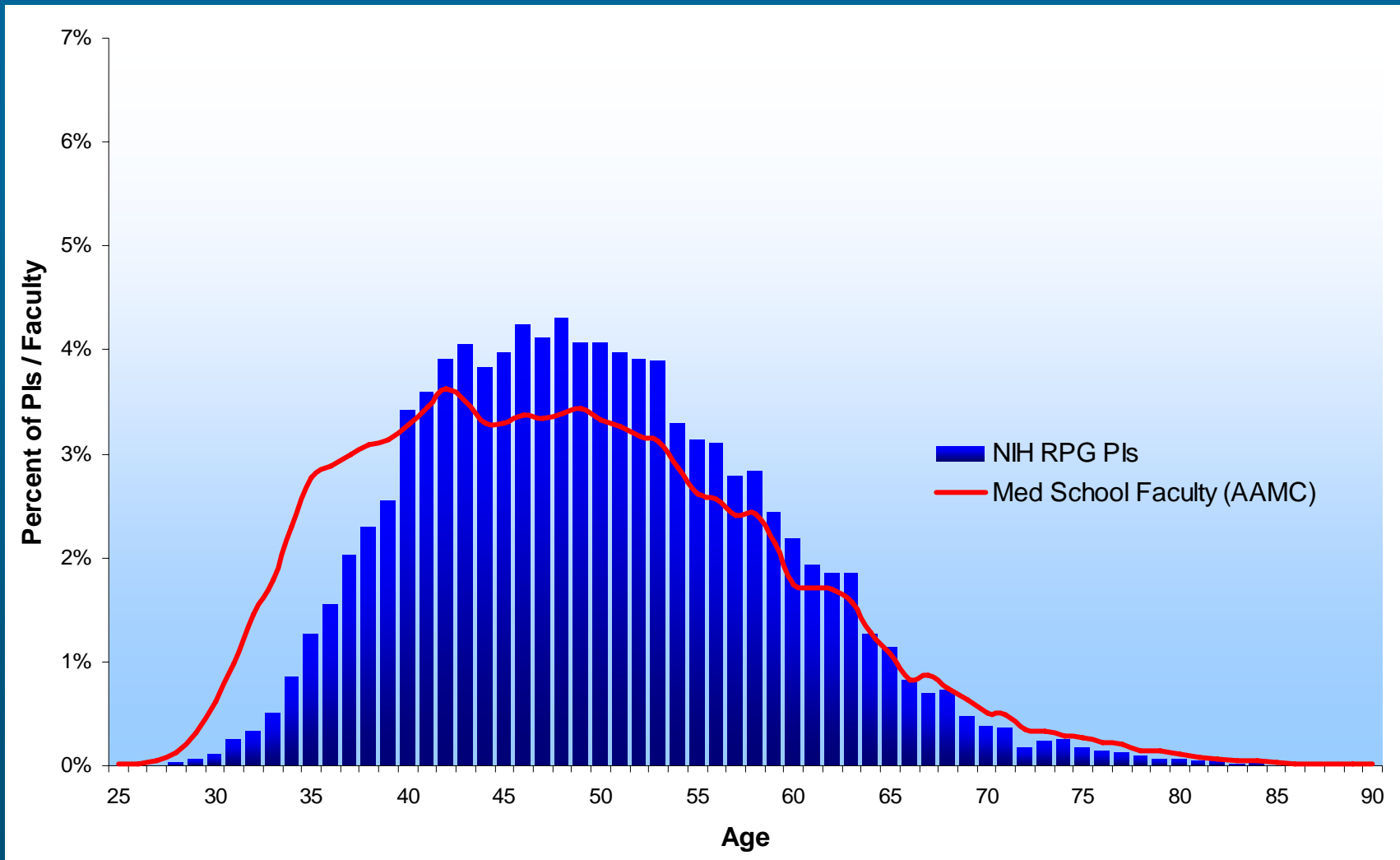
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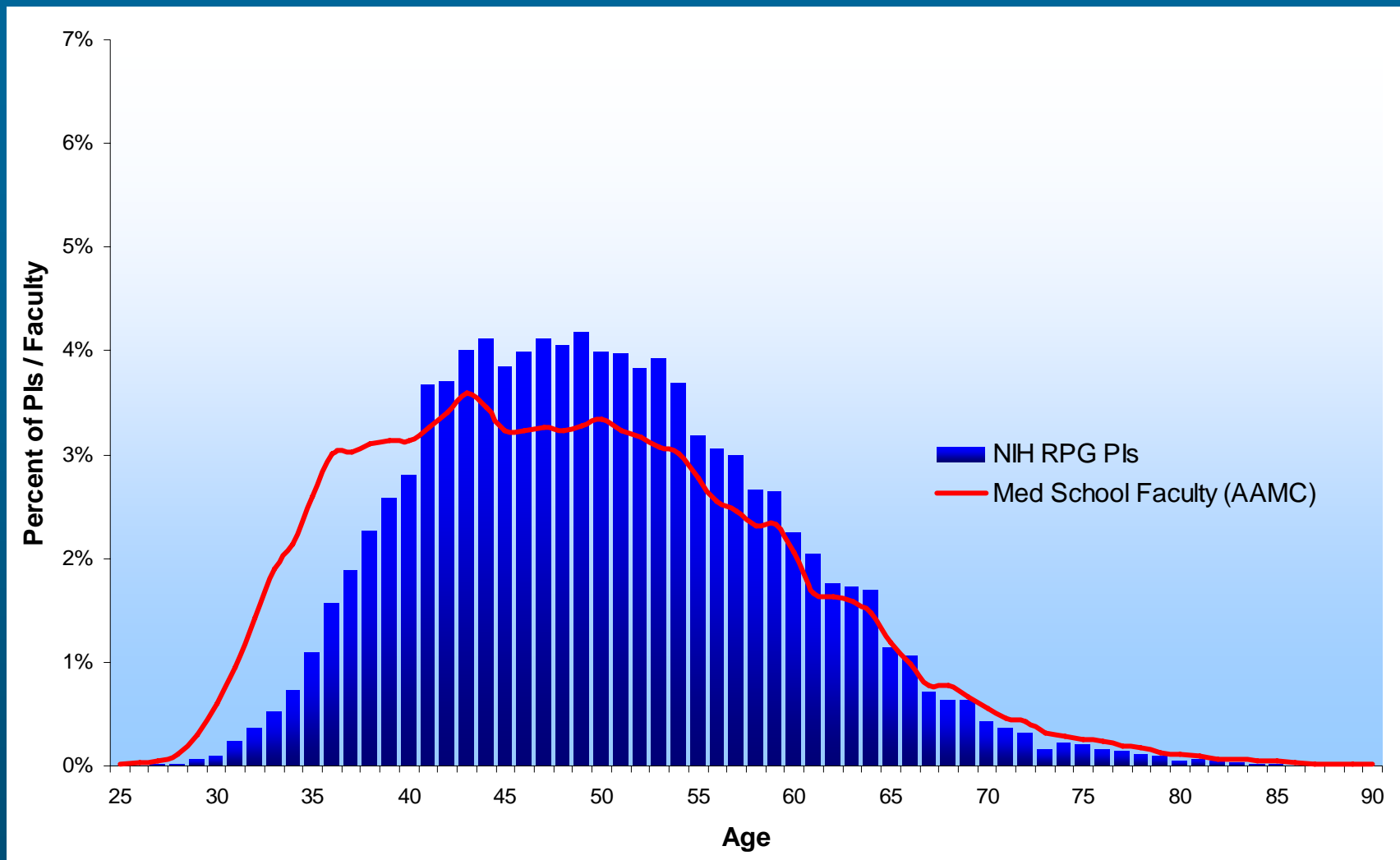
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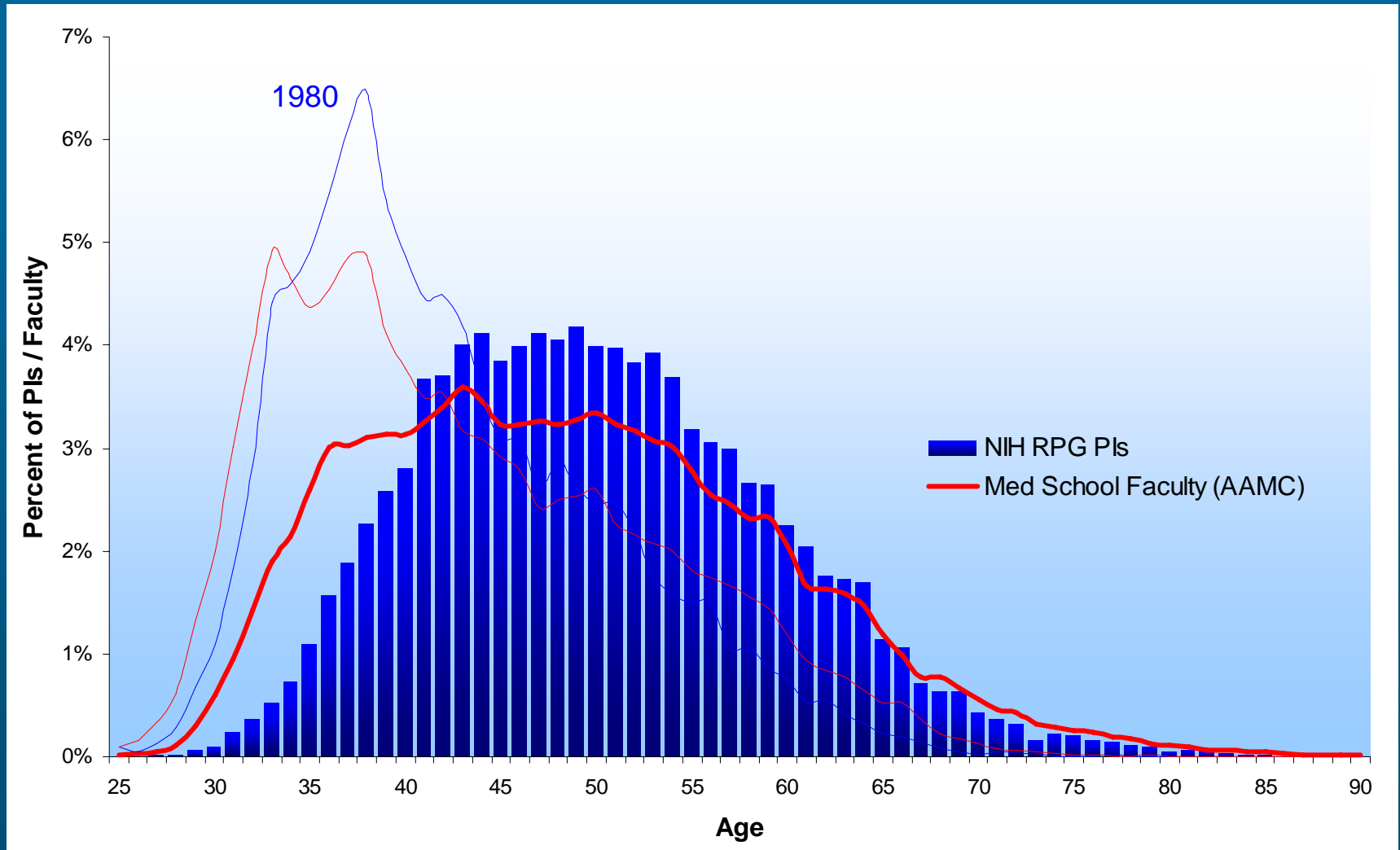
Sources: IMPAC II Current and History Files and AAMC Faculty Roster

# 2006



Sources: IMPAC II Current and History Files and AAMC Faculty Roster

# 2006



Sources: IMPAC II Current and History Files and AAMC Faculty Roster

# Original “endangered species” article:

## THE CLINICAL INVESTIGATOR AS AN ENDANGERED SPECIES\*

JAMES B. WYNGAARDEN, M.D.

Fredric M. Hanes Professor and Chairman  
Department of Medicine  
Duke University Medical Center  
Durham, North Carolina

**T**he title of this symposium is “The Academic Physician: An Endangered Species.” There is a paradox in that title. The paradox is that we have never had more full-time physicians in academic medicine than we have right now. About 33,000 physicians have full-time faculty positions in the United States, and that is close to 10% of the physicians in this country. This large figure reflects the expanding clinical roles of academic medical centers, which include, for example, 25% of all acute and intensive care beds of the country. Annual Association of American Medical Colleges surveys of funded, unfilled faculty vacancies have listed about 1,000 available positions each year over the last 10 or 15 years. Each year faculty ranks grow by 1,000, but another 1,000 new positions become available to be filled the following year. Thus, in the global sense there continues to be a shortage of academic physicians. But these position vacancies tend to be concentrated in specific fields, such as anesthesiology and pathology, with high service requirements. These are not the endangered species that I am referring to.

Eighteen months ago, as part of a presidential address, I discussed this topic with respect to the *clinical investigator* with special emphasis on the *physician-scientist*.<sup>1</sup> I use that term to signify an individual thoroughly trained in clinical medicine and *also* thoroughly trained in a scientific discipline, and who, in addition, participates in both clinical and experimental endeavors as a career role. Thus I refer to the physician who is simultaneously a serious scientist, and far less to the clinician who may occasionally also do some research. I want to discuss the topic in that

\*Presented as part of a *Symposium on The Academic Physician: An Endangered Species* held by the Committee on Medical Education of the New York Academy of Medicine October 10, 1980.

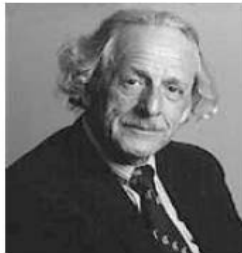
From The American Scholar, Volume 53, No. 3, Summer 1984.  
Copyright c 1984 by the author.

# The End of the Physician-Scientist?

GORDON N. GILL

Essays of an Information Scientist: Science Reviews, Journalism Inventiveness and Other Essays, Vol:14,  
p.261, 1991|

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## **Not the End of the Physician-Scientist**

Reprinted from *THE SCIENTIST* ® 1(21):9, 21 September 1987.

Published in **Volume 99, Issue 12** (June 15, 1997)  
*J. Clin. Invest.* **99**(12): 2803-2812 (1997). doi:10.1172/JCI119470.  
Copyright © 1997, The American Society for Clinical Investigation

### **Editorial**

**The clinical investigator: bewitched, bothered, and bewildered--but still beloved.**

J L Goldstein and M S Brown





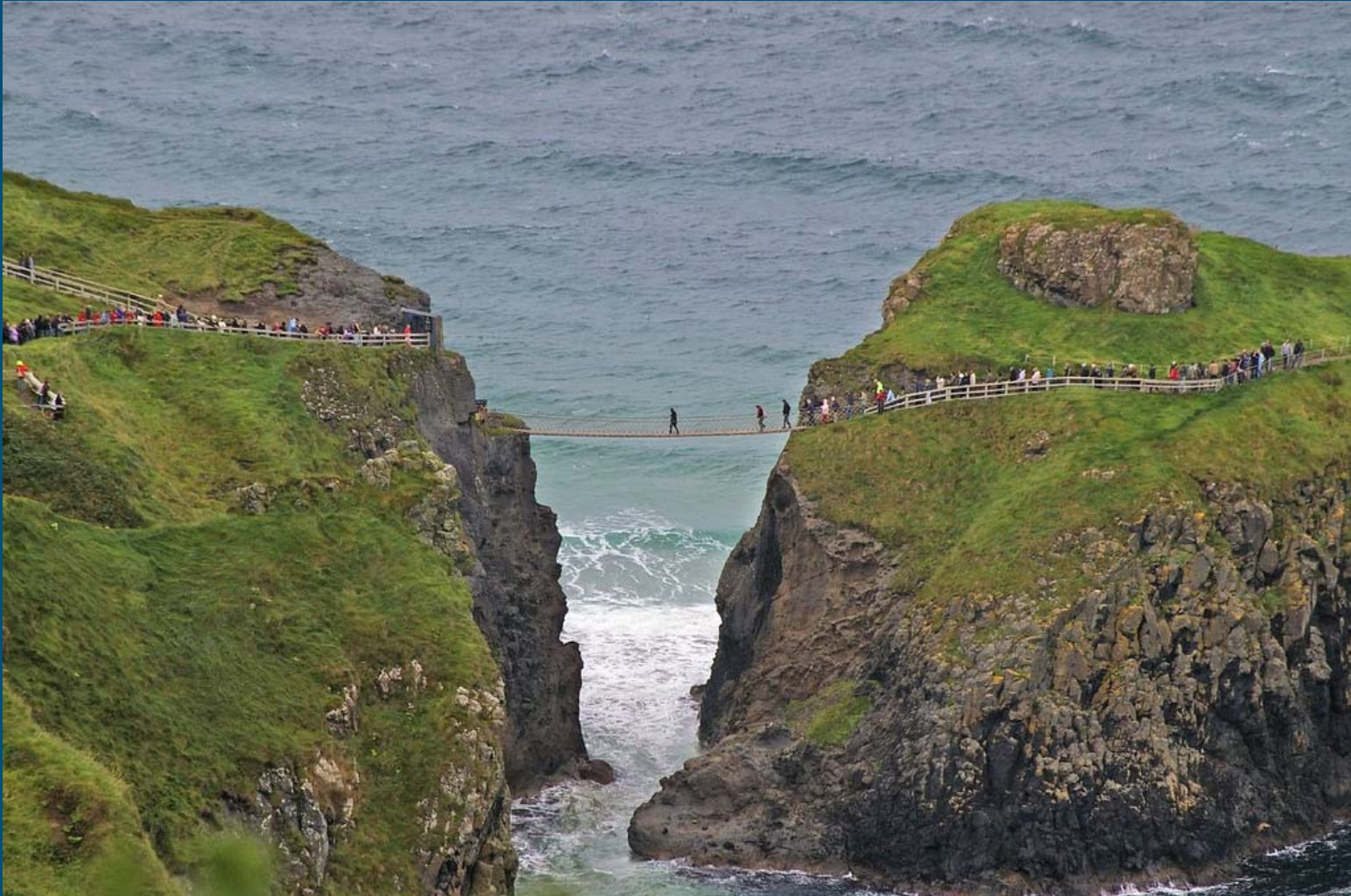
# Chasm between Basic Science and Clinical Practice

# Chasm between Basic Science and Clinical Practice

- Scientific

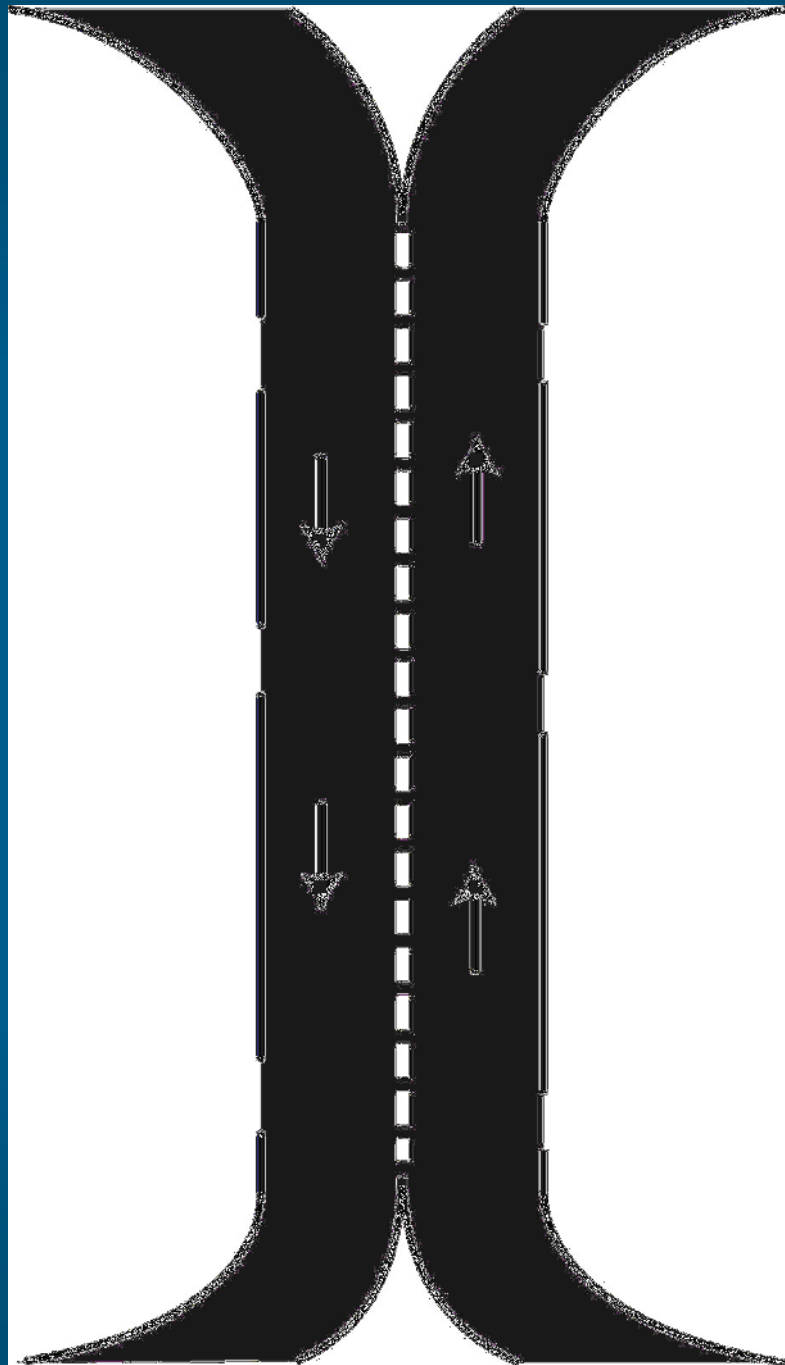


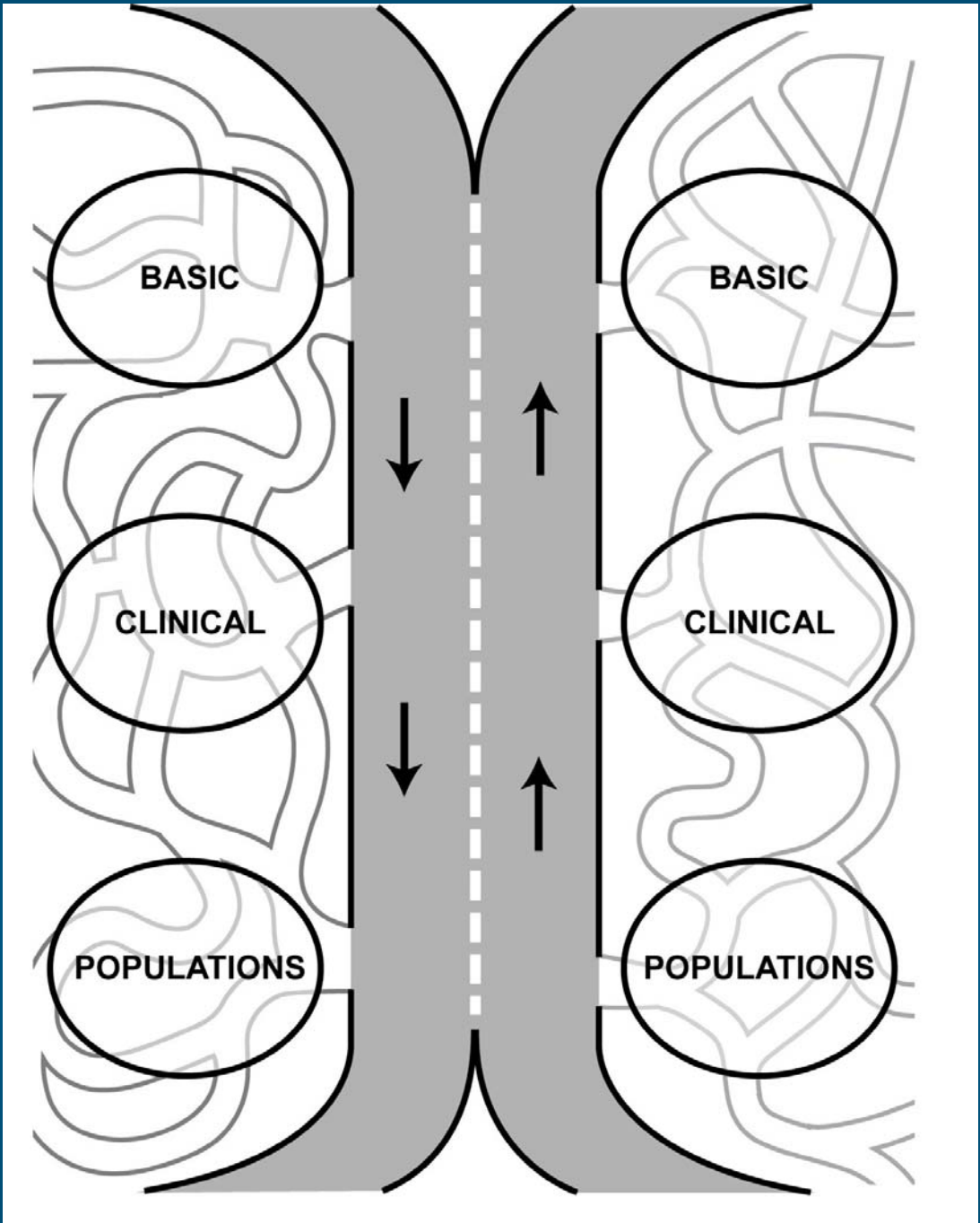
# Bridging the Chasm

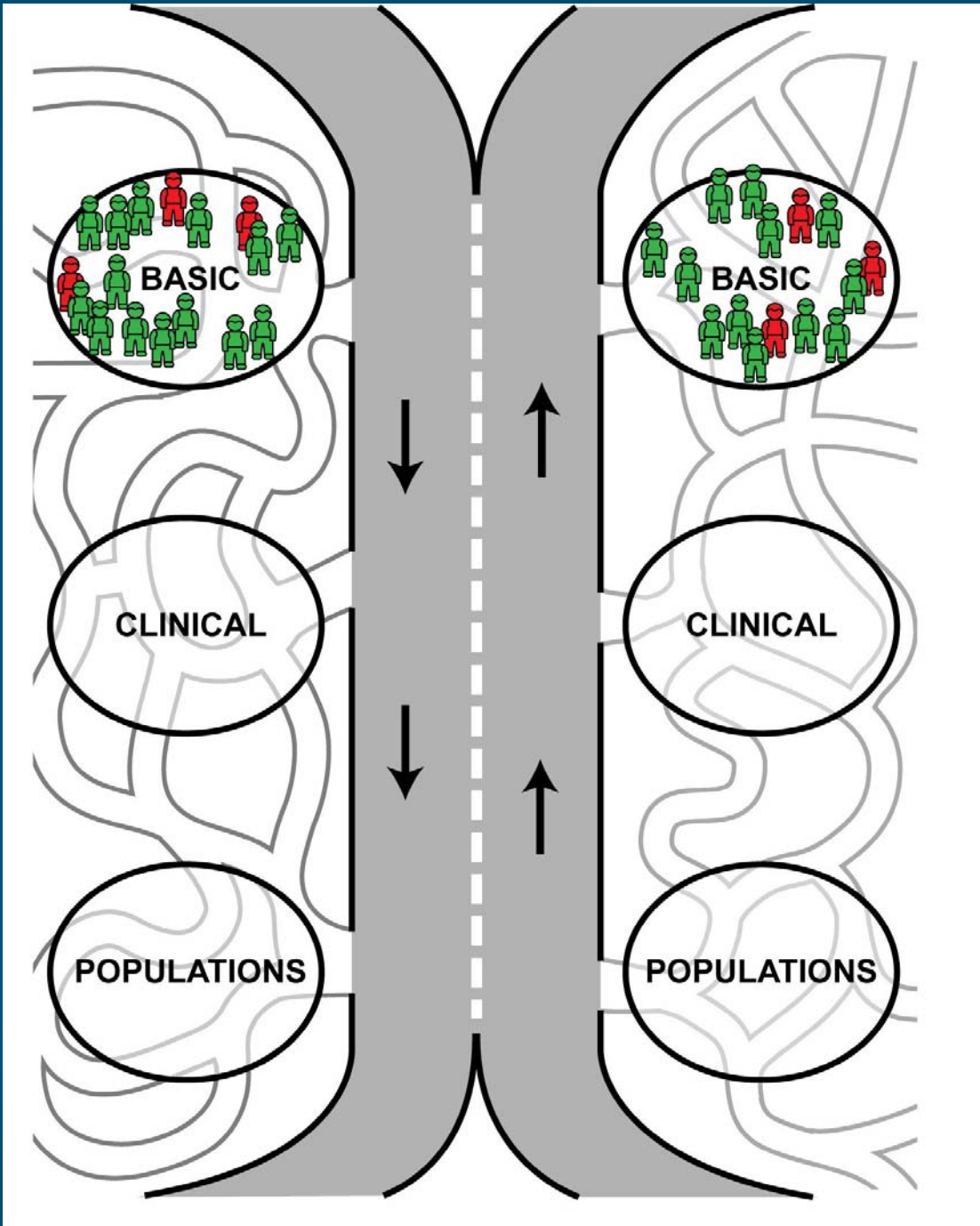


# Bridging the Scientific Chasm between Basic Science and Clinical Practice

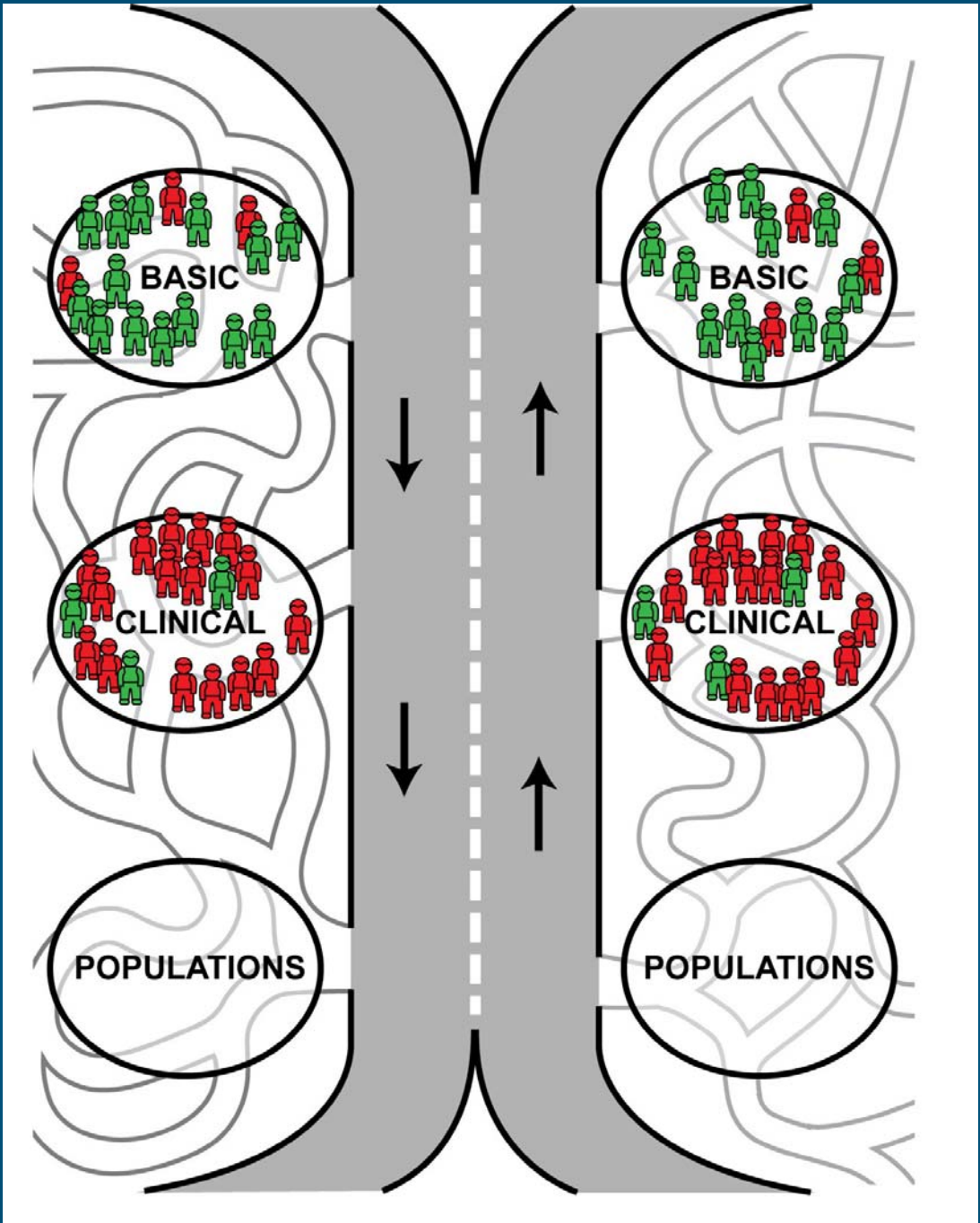
- Reductionism of molecular biology
- Integrationism of systems biology
- Translational research
- Evolution of physicians as members of research teams





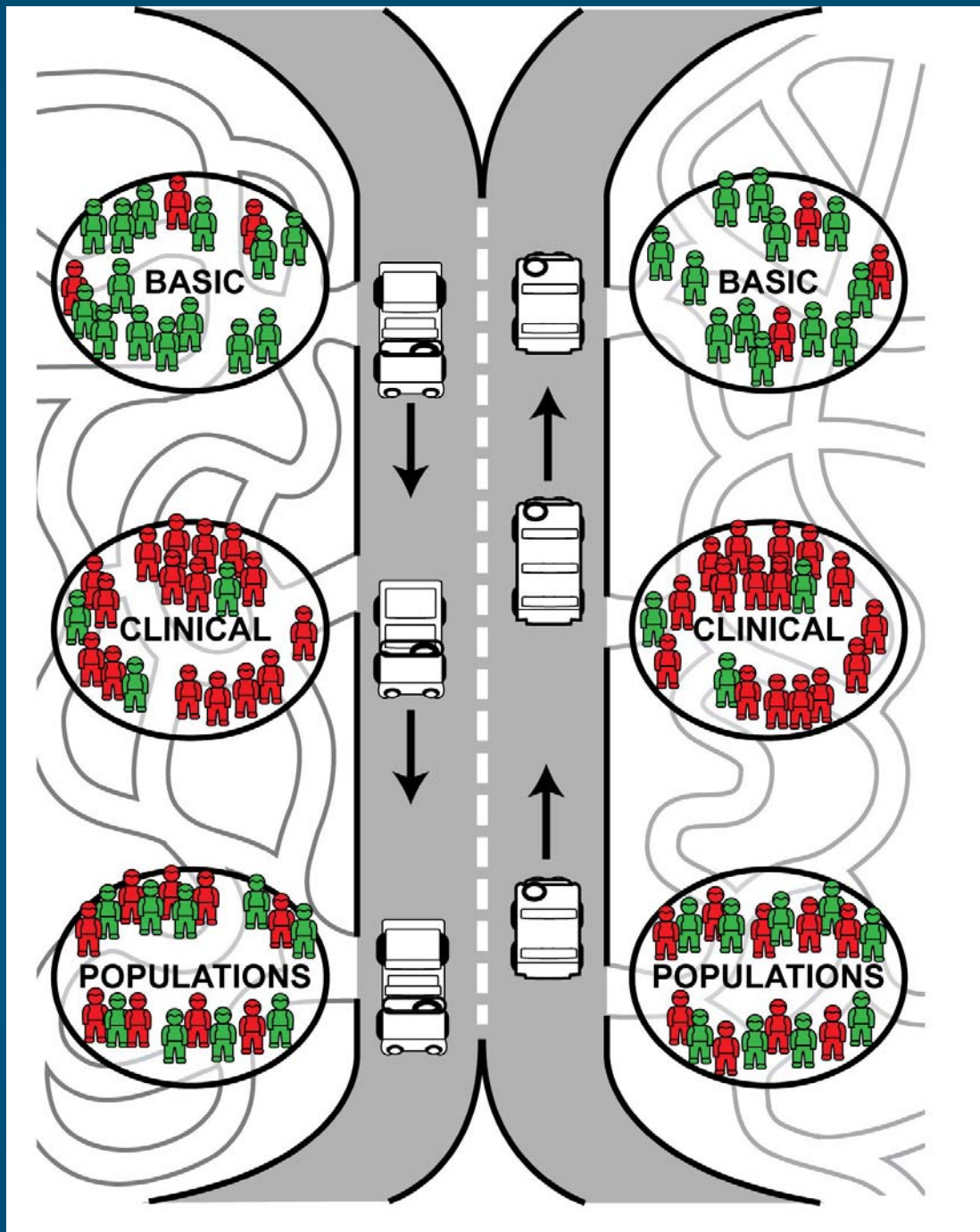


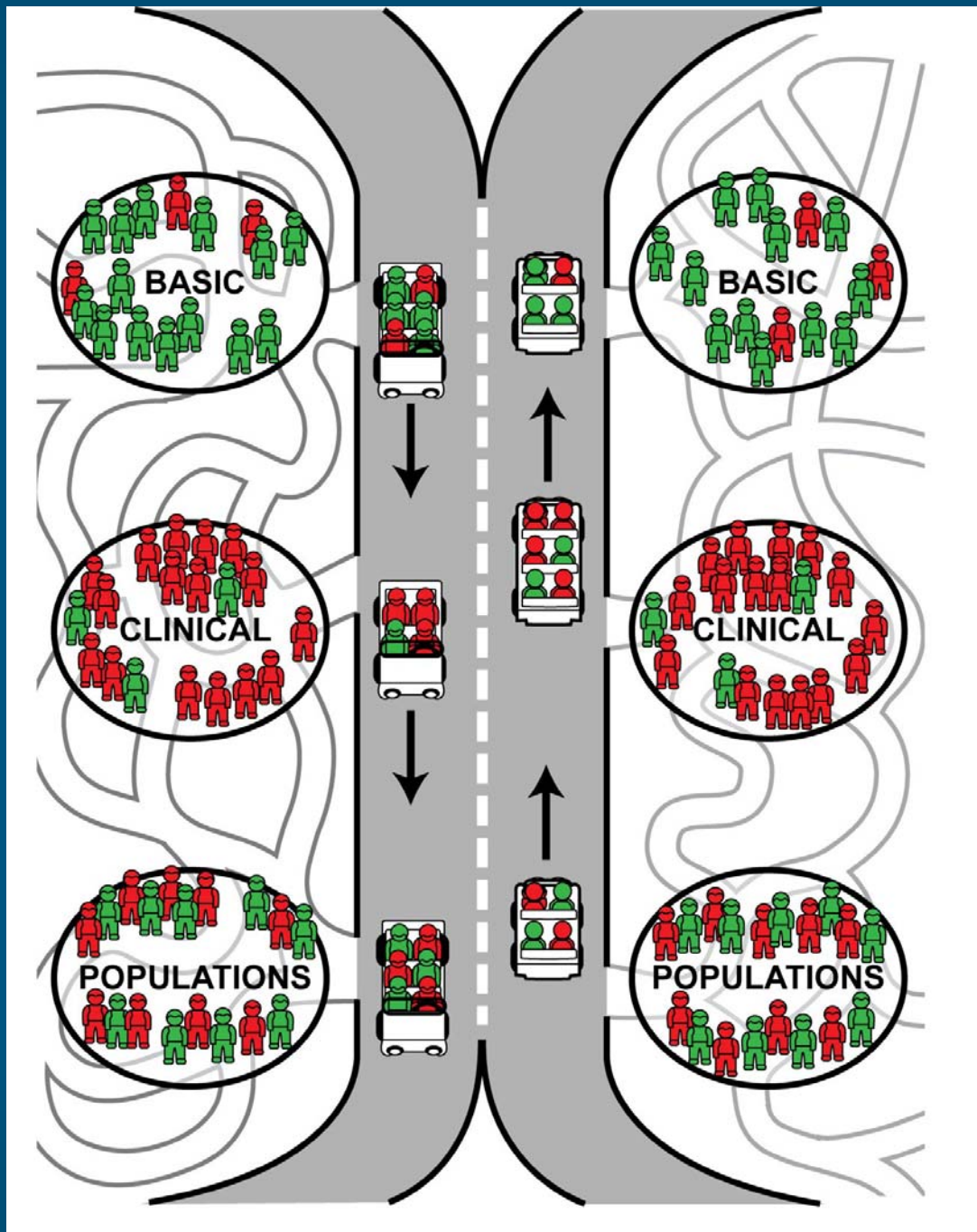












# Chasm between Basic Science and Clinical Practice

- Scientific
- Cultural

# Cultural Barriers Separate Clinical Medicine from Basic Science

(from Barry S. Coller)

Need for  
Immediate Action

Avoiding Rush to  
Judgment

Adherence to  
standards of  
practice

Encouragement  
to challenge  
existing  
paradigms

# Cultural Barriers Separate Clinical Medicine from Basic Science

(from Barry S. Coller)

Respect for  
hierarchy and  
expert authority

Critique,  
challenge  
accepted wisdom

Errors as mortal  
threats

Errors as inevitable  
manifestations of  
creative process

# Cultural Barriers Separate Clinical Medicine from Basic Science

(from Barry S. Coller)

Focus on unique

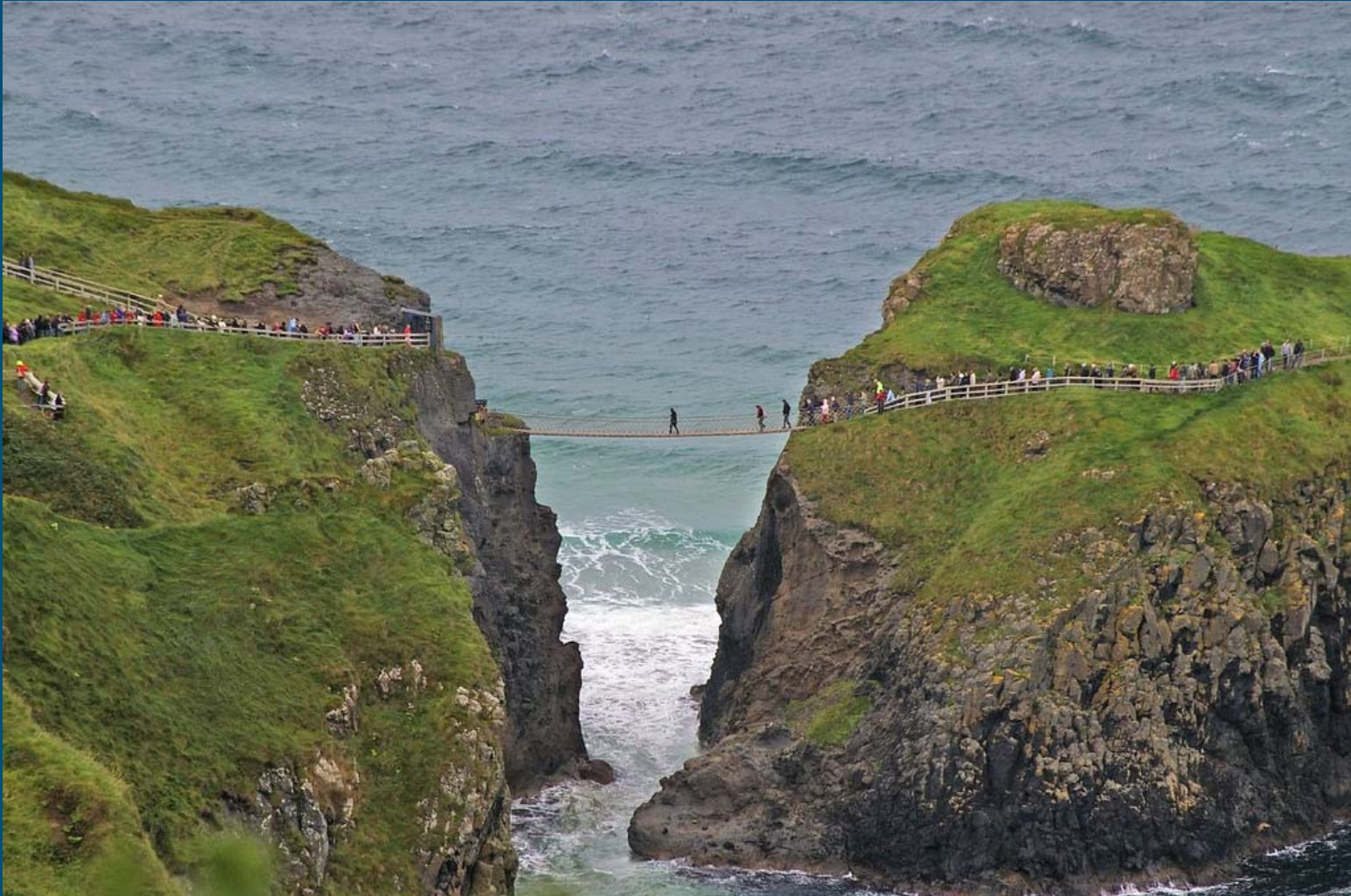
Focus on  
generalizable  
principles

Commitment to  
the Physician's  
Oath

Commitment to  
Search for the Truth



# Bridging the Chasm





# Bridging the Cultural Barriers between Basic Science and Clinical Practice

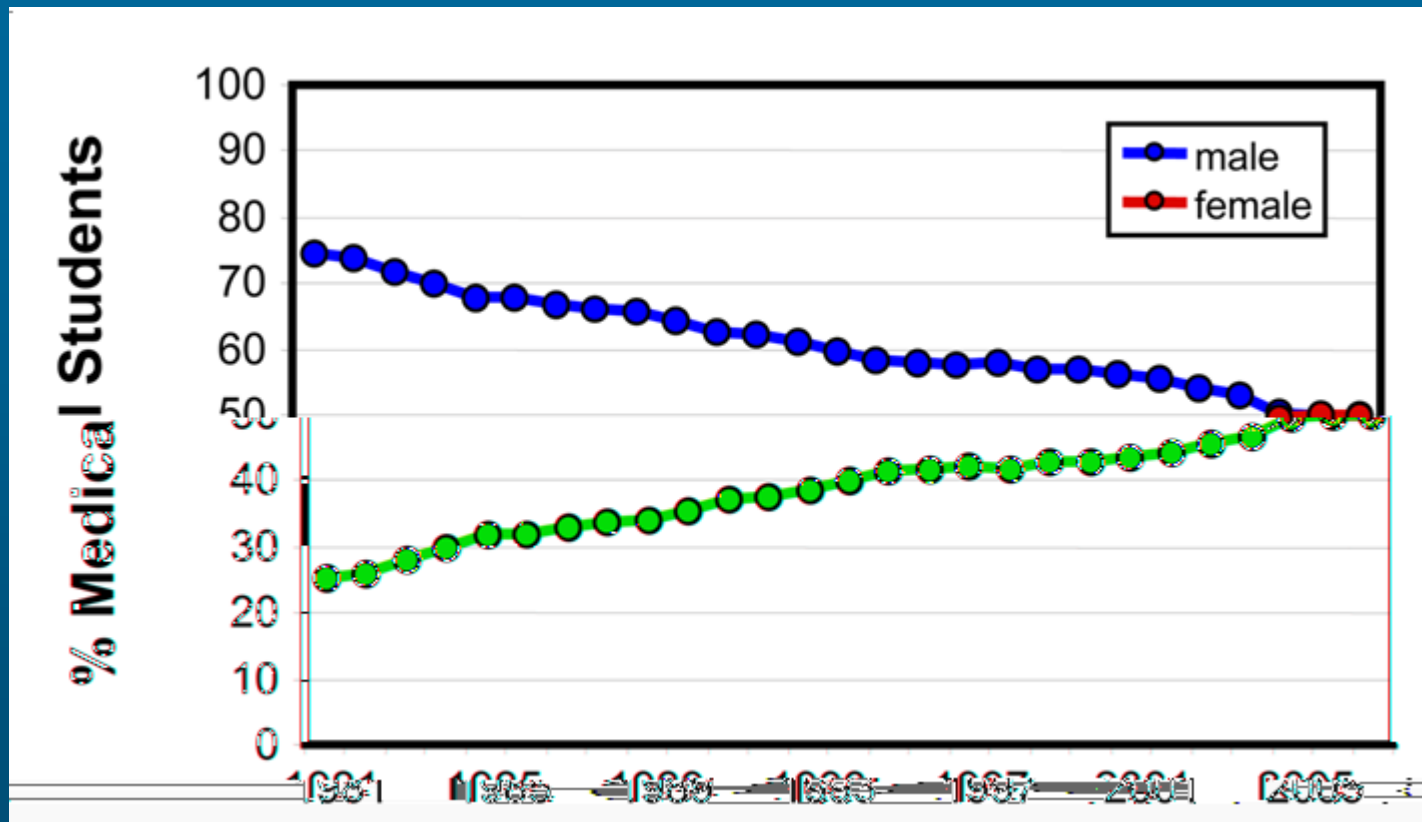
- *Vive la différence*
- Institutional leadership to cultivate a climate of mutual respect and trust
- Research team building
- MD trainees experience laboratory research
- PhD trainees experience clinical medicine (e.g. HHMI “Med Into Grad” Initiative)

# Major Contemporary Issues in Physician-Scientist Career Development

1. Women physician-scientists

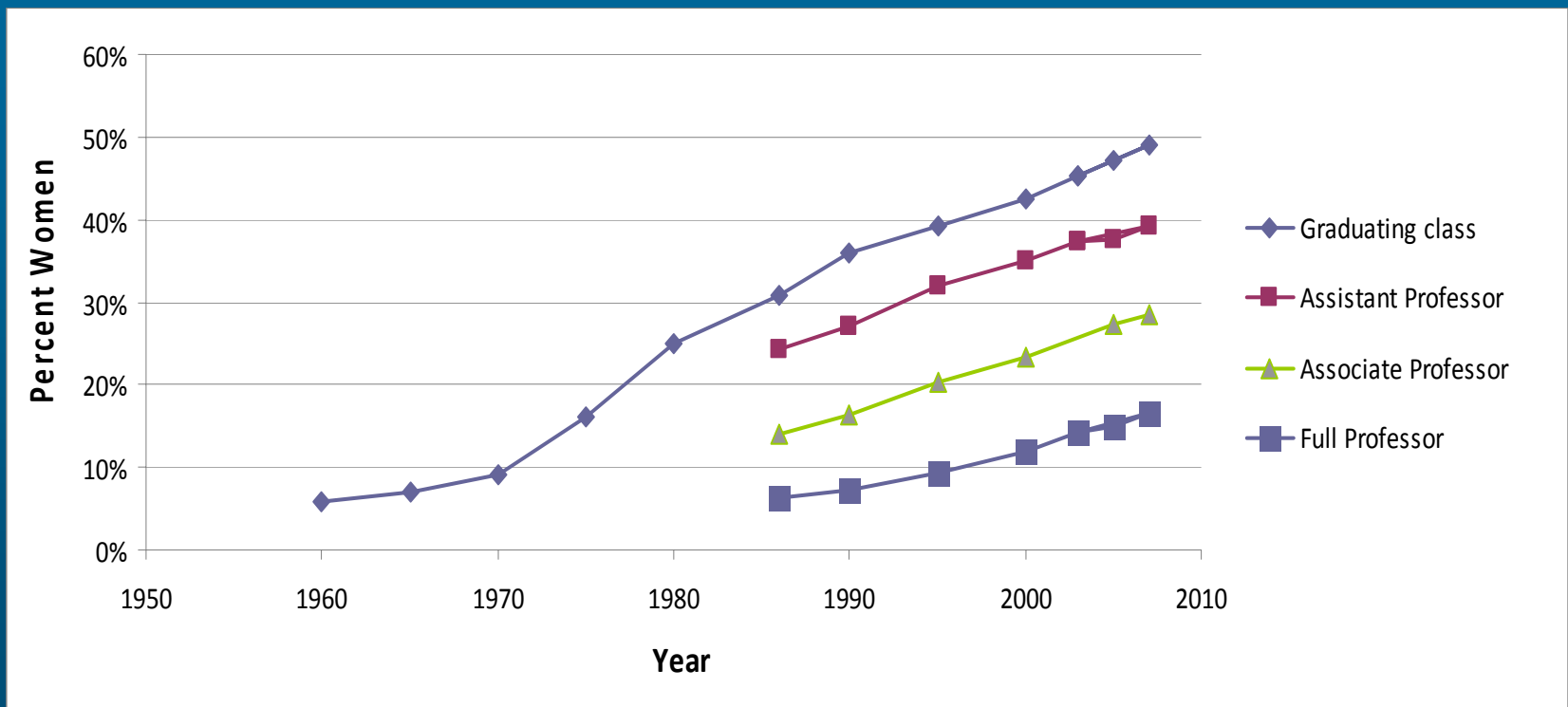
# Women Physician-Scientists

## Gender Distribution of Matriculated Medical Students



# Women Physician-Scientists

Medical School Faculty, by Gender and Rank Over Time: “Slow Pipeline” versus “Leakage from Pipeline”



# Why Women Find Physician-Scientist Careers Less Attractive Than Do Men

- Concerned that it will be impossible to combine a successful career with childbearing and family life
- Feel that they have to be better than their male counterparts to be considered equal
- Receive little encouragement to become physician-scientists
- Lack compelling role models

- Andrews, NC. *Nature Med*, 2002.

# Major Contemporary Issues in Physician-Scientist Career Development

1. Women physician-scientists
2. Generation gap in expectations

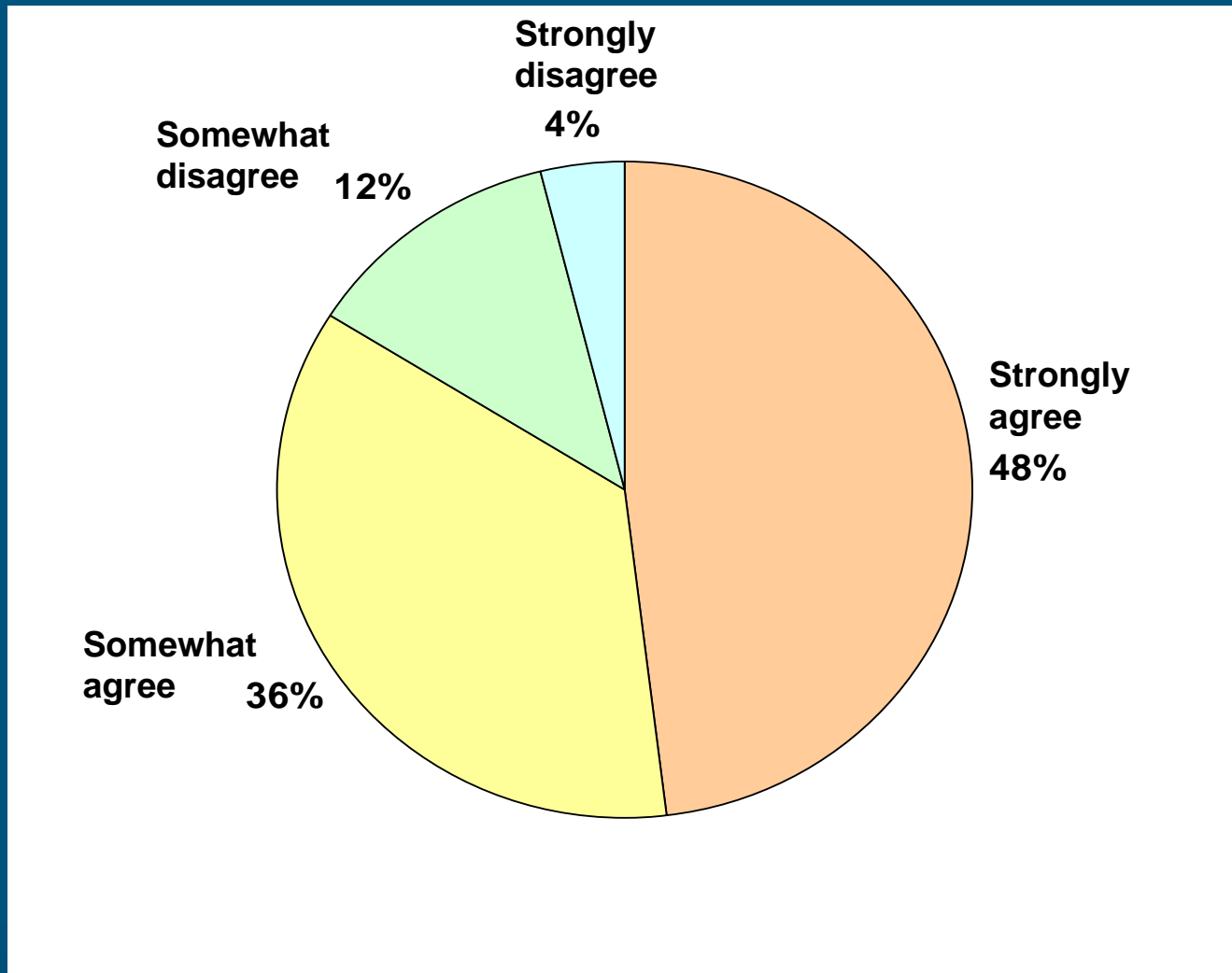


“There’s a tremendous generation gap between what the current generation of junior faculty want and what the current generation of senior faculty perceive as correct.”

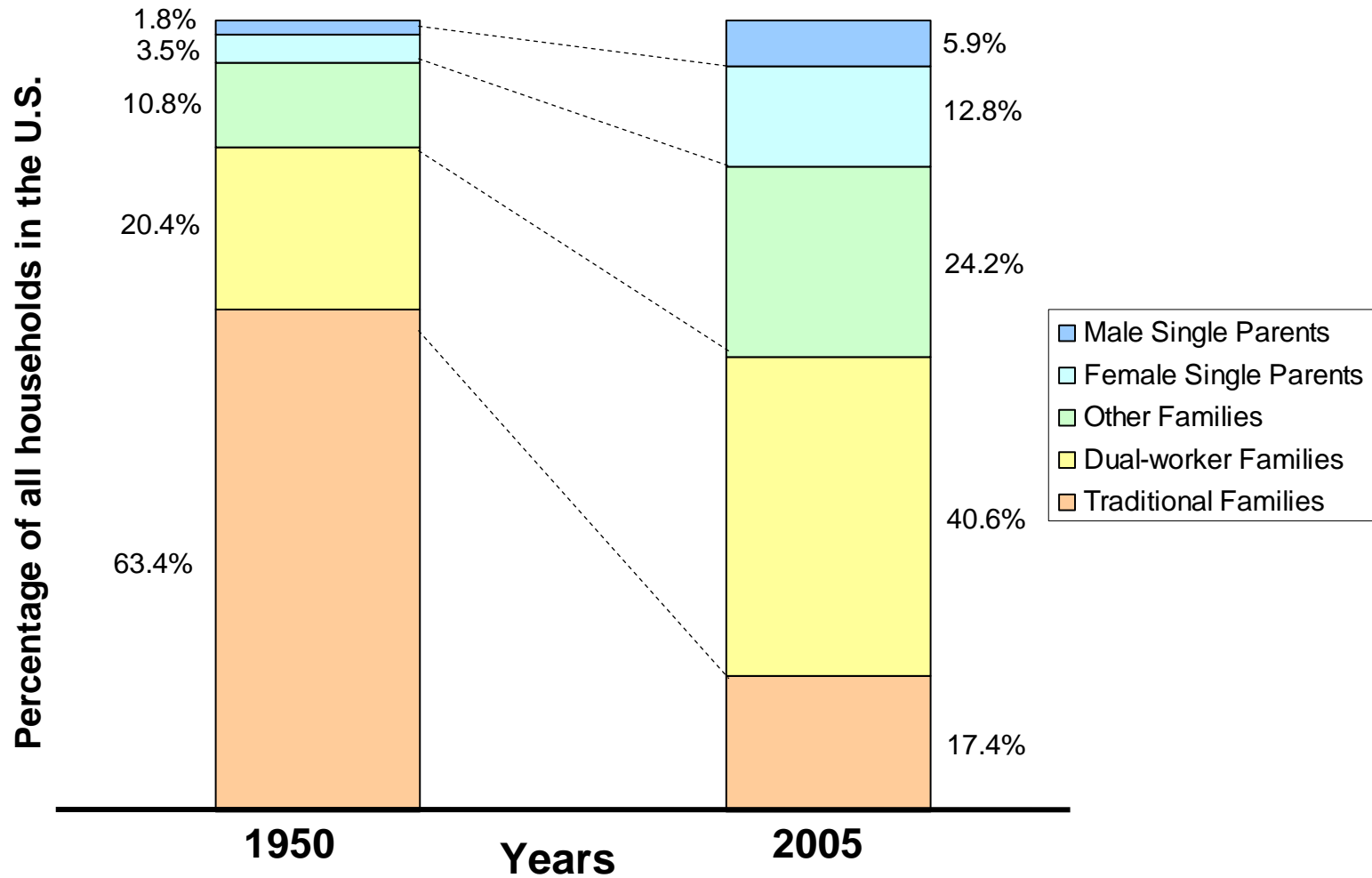
*-Junior male faculty MD-scientist, Duke  
Faculty Focus Group*



# Male executive survey question: “I want job options that let me have more personal time”



# Changing Family Structures



Source: Benko C, Weisberg A. Mass Career Customization: Aligning the Workplace with Today's Nontraditional Workforce, 2007.

# Memorandum from Einstein to Mileva Einstein-Maric

18 July 1914

- A. You will see to it that:
1. My clothes and laundry are kept in good order;
  2. I will be served three meals regularly in my room;
  3. My bedroom and study are kept tidy, and especially that my desk is left for my use only.
- B. You will Relinquish all personal relations with me insofar as they are not completely necessary for social reasons. Particularly, you will forgo my:
1. Staying at home with you;
  2. Going out and traveling with you.
- C. You will obey the following points in your relations with me:
1. You will not expect any tenderness from me, nor will you offer any suggestions to me;
  2. You will stop talking to me about something if I request it;
  3. You will leave my bedroom or study without any back talk if I request it.

# The New Workforce Imperative

## Corporate Ladder:

- Traditional hierarchy
- Linear path upward
- Move or stop moving
- Fits traditional family structure
- Assumes workers' needs remain consistent over time



## Corporate Lattice:

- Multiple, individualized paths upward
- Move faster, slower; change directions
- Personalized career-life fit
- Adjusts as workers' needs change over time

# Off-Ramps and On-Ramps: Keeping Talented Women on the Road to Success

(Harris survey of 2400 “highly qualified” professional women and 653 men ages 28-55)

- Two thirds of highly qualified women have discontinuous or nonlinear careers
- 93% of women who stepped out of the workforce want to return to their careers
- Most organizations are ill equipped to make reentry possible, let alone easy

*-Hewlett SA, 2007*

# Major Contemporary Issues in Physician-Scientist Career Development

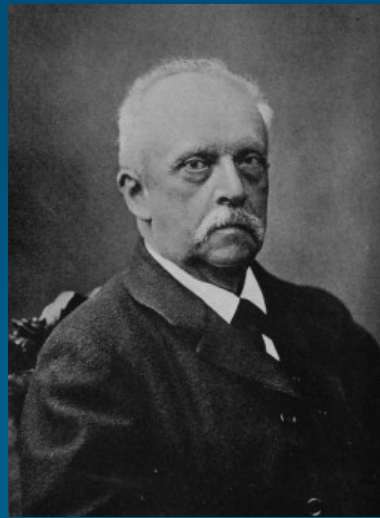
1. Women physician-scientists
2. Generation gap in expectations
3. Mentoring



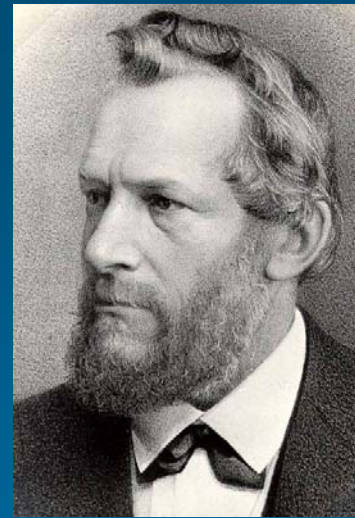
Johannes Peter Muller  
(1801-1858)



Carl  
Ludwig



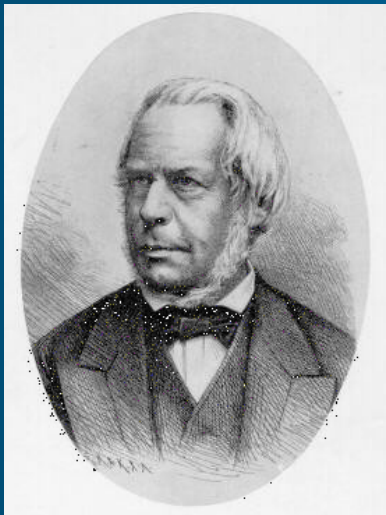
Hermann  
Helmholtz



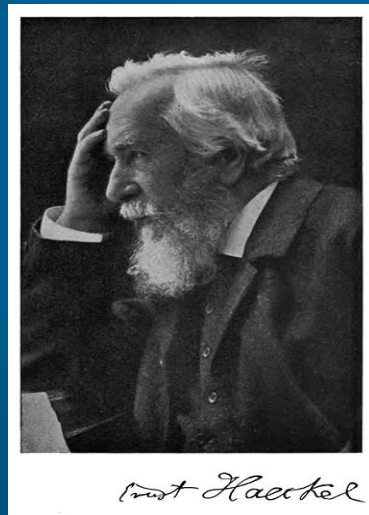
Emil du Bois-  
Reymond



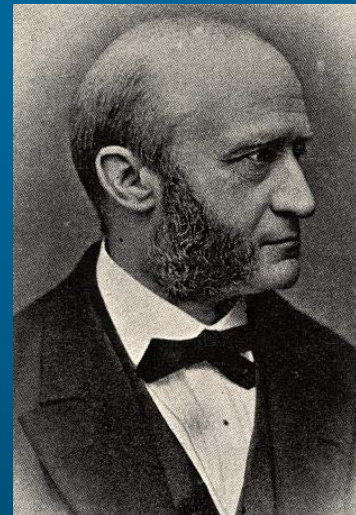
Theodor  
Schwann



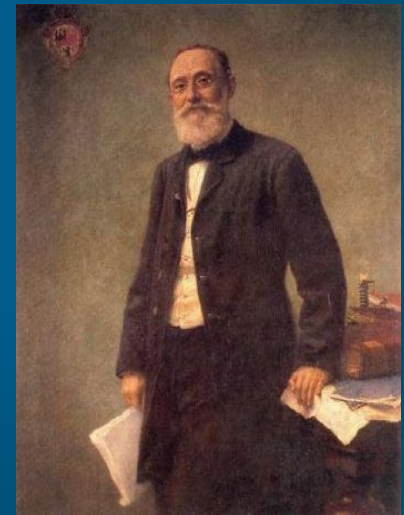
Friedrich  
Henle



Ernst  
Haeckel

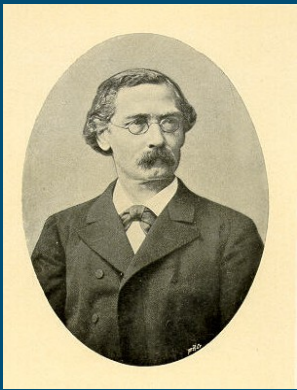


Ernst von  
Brucke

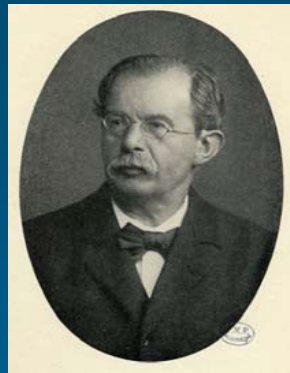


Rudolf  
Virchow

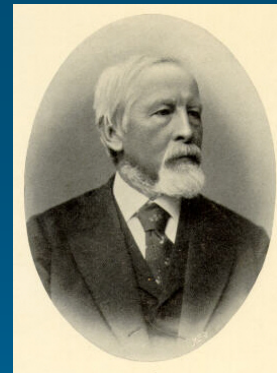




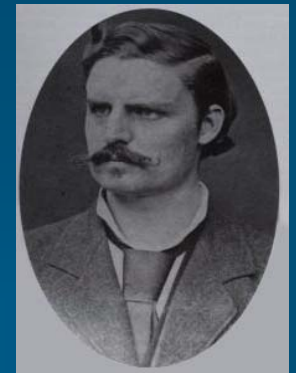
Hoppe-Seyler



Recklinghausen



Kussmaul



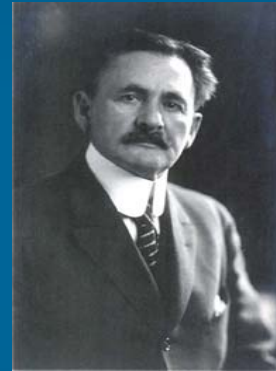
Fick



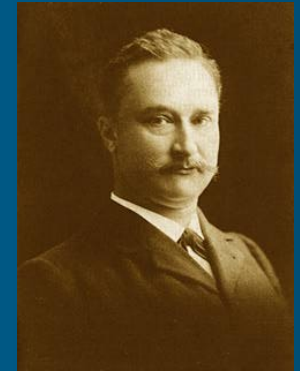
William Welch



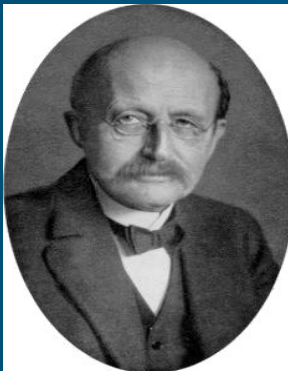
William Welch



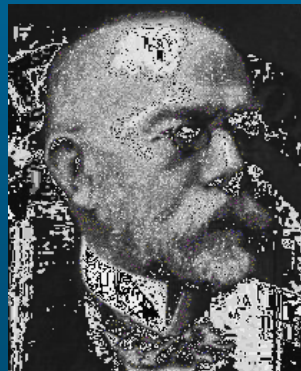
A.A. Michelson



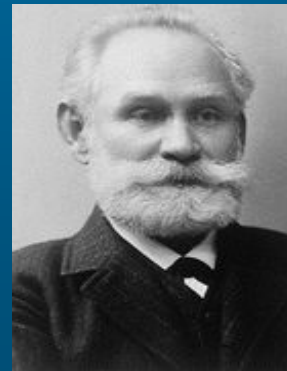
Eugene Dubois



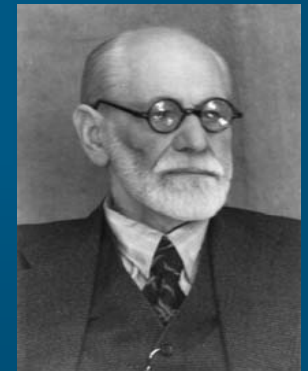
Max Planck



Koch



Pavlov



Freud

# Contemporary Approaches to Mentoring

- Mentoring teams
- Multigenerational mentoring
- Dynamic process

# How to Succeed as a Clinician Scientist

## 1. Being mentored effectively

- Proactively cultivate mentors
- Mentor phenotypes
  - scientific advisors
  - “godfathers”/ “godmothers”
- Become a good mentee
- Learn early how to *become* an effective mentor
- Career-long necessity

# How to Succeed as a Clinician Scientist

## 2. Starting your faculty research career

- Focus, focus, focus
- Don't be seduced into many different non-research responsibilities
- Be selective about writing review articles, chapters
- Cultivate/fertilize your research creativity
- Find great collaborators
- Attract great trainees
- When do you know you are hitting a wall?

# How to Succeed as a Clinician Scientist

## 3. Qualities of the successful academic physician and clinical investigator

- Scientific integrity
- Intellectual balance
- Resilience, tenacity, perseverance
- Ability to communicate clearly and persuasively
- Organizational skills
- Ability to focus
- Time management skills
- Responsiveness to critique