February 2013 COGR Meeting Friday Morning Presentation - Sally Rockey

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Biomedical Research Workforce Proposed Implementation

February 2013

Sally J. Rockey, PhD
Deputy Director for Extramural Research
National Institutes of Health

CHARGE

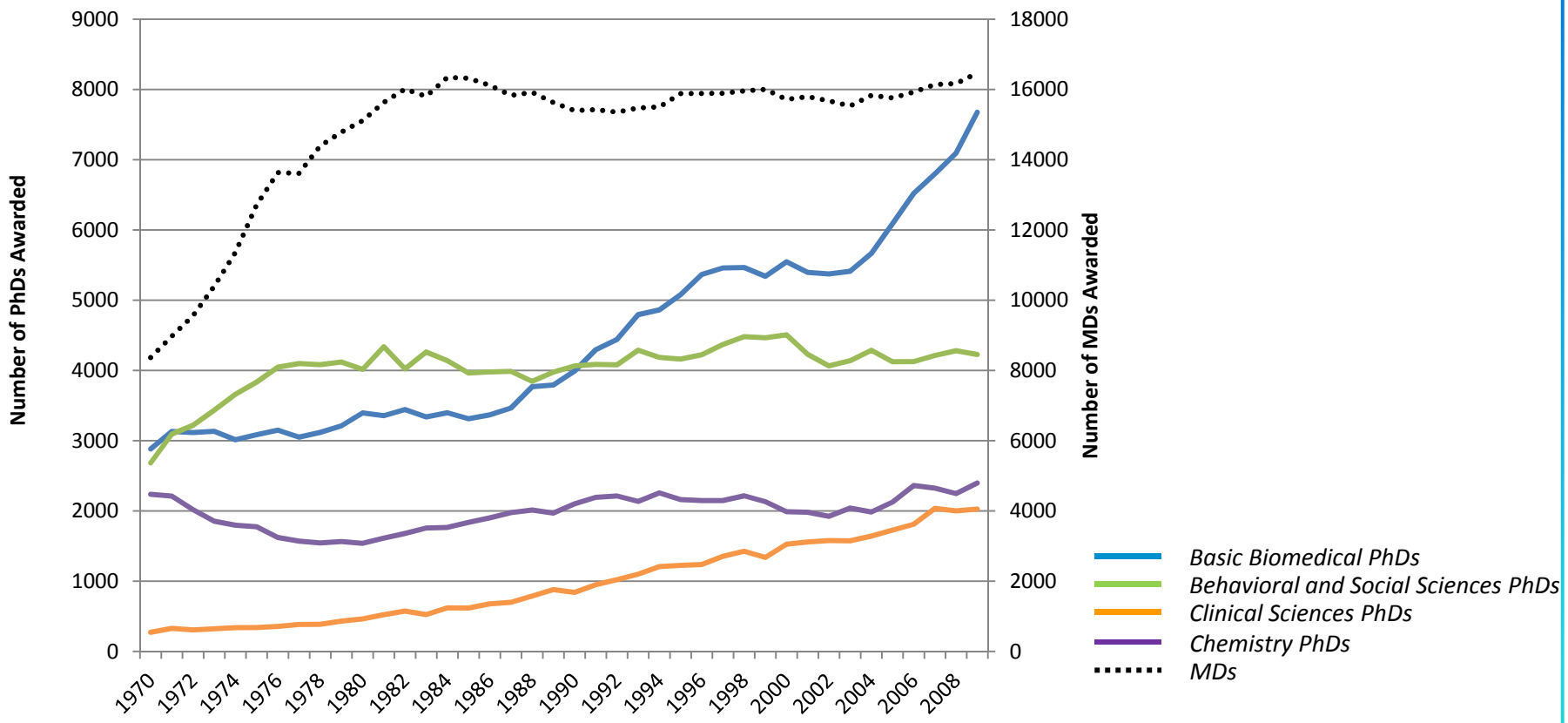
1. Develop a model for a sustainable and diverse U.S. biomedical research workforce that can inform decisions about training of the optimal number of people for the appropriate types of positions that will advance science and promote health.

2. Based on this analysis and input from the extramural community, the committee will make recommendations for actions that NIH should take to support a future sustainable biomedical infrastructure.

Preconceived Notions

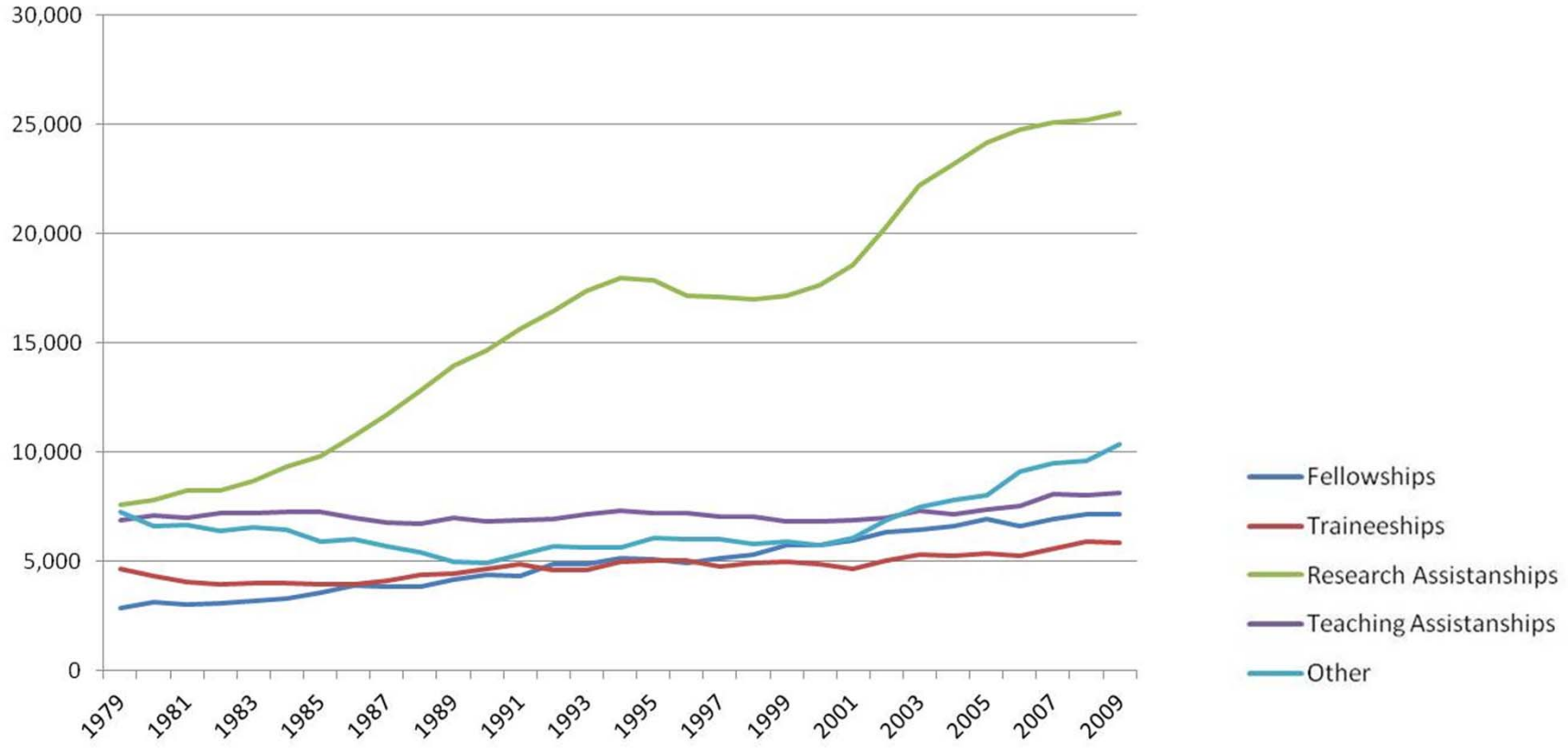
1. Training for a career in biomedical research is taking too long
2. Training is getting longer every year
3. Too many PhDs are being produced for the number of jobs that take advantage of the training
4. The average age of an investigator receiving his or her first R01 is approaching 42 years of age
5. These conditions are turning away the “best and the brightest”
6. While all of the above may be true, the enterprise is immensely productive, and should not be changed

US PhD and MD Degrees Awarded, by Field



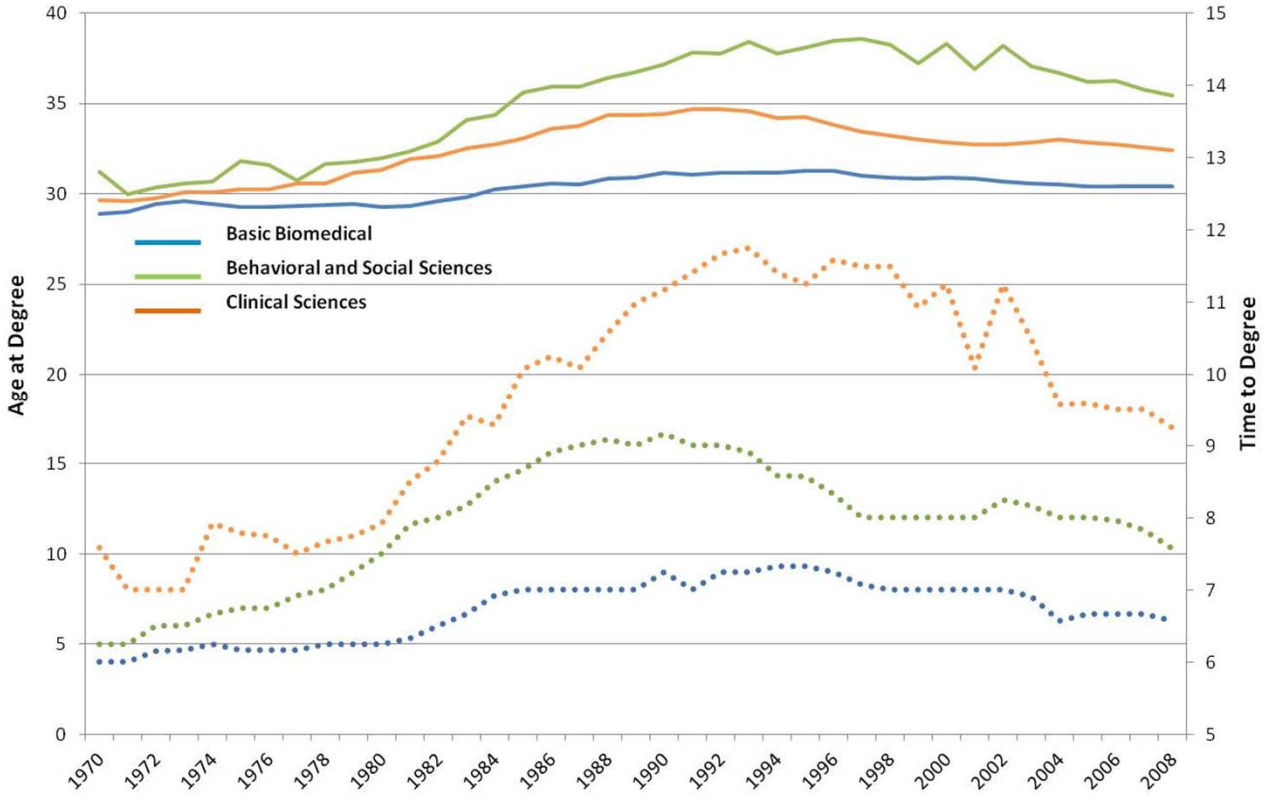
Source: Survey of Earned Doctorates

Doctorate Students by Type of Support



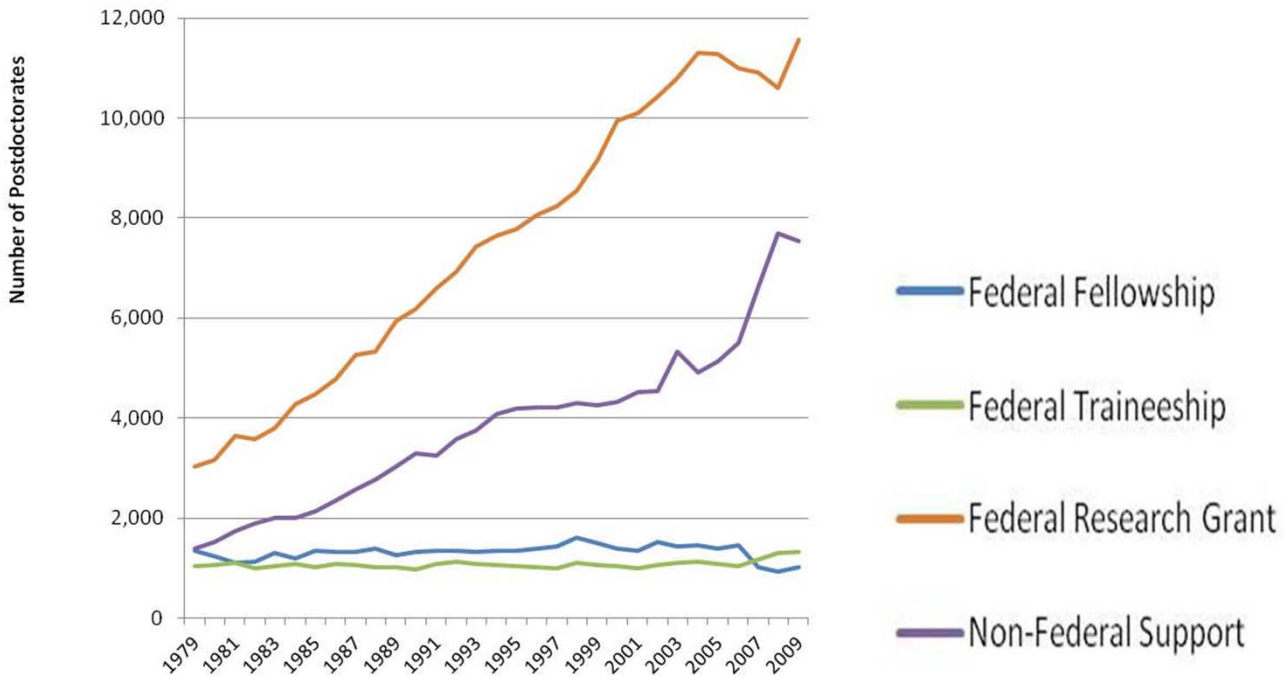
Source: Graduate Student Survey

Time to Degree and Age at Degree



Source: Survey of Earned Doctorates

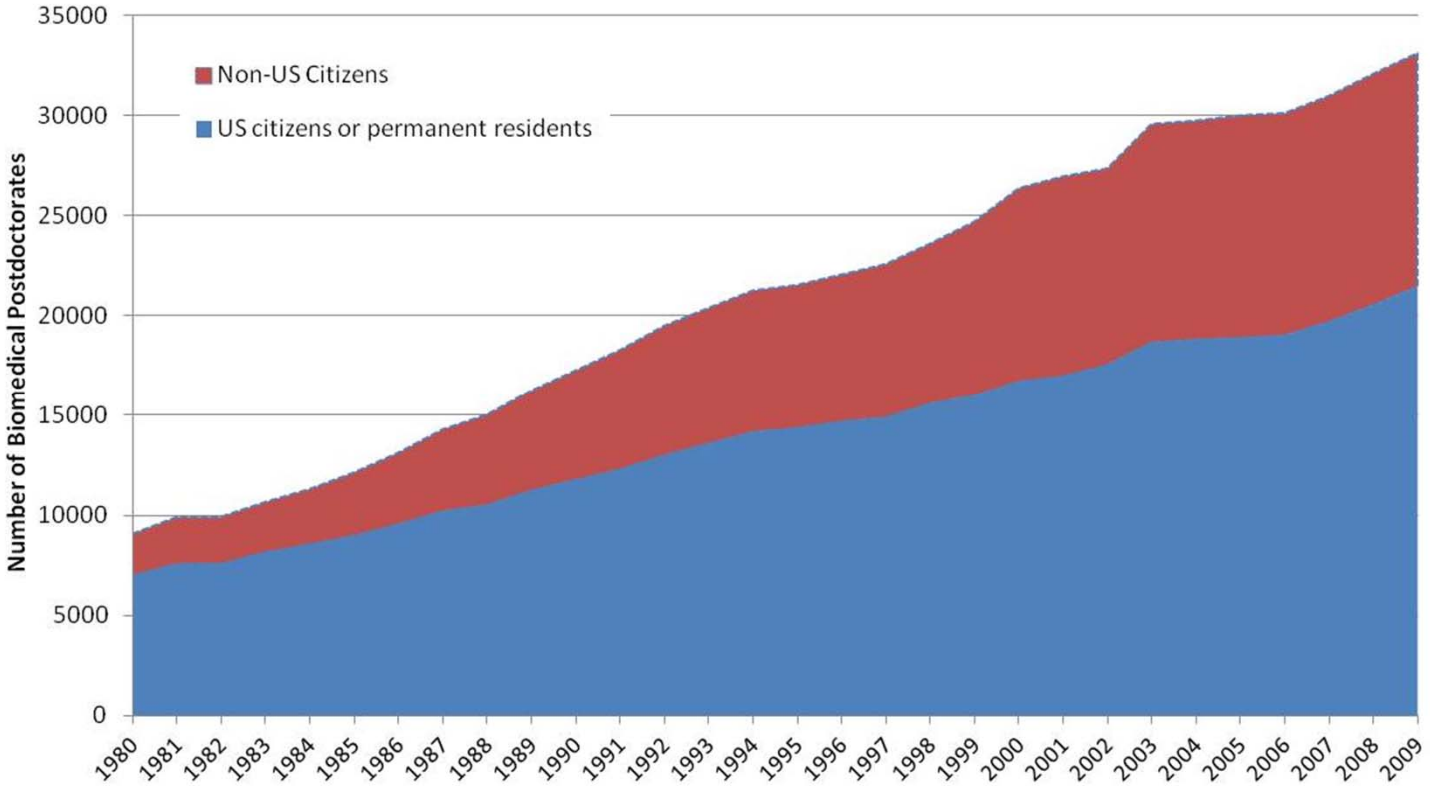
Postdoctoral Researchers by Type of Support



Note: "nonfederal support" is defined as support from state and local government, institutions, foreign sources, foundations, industry and other private sources.

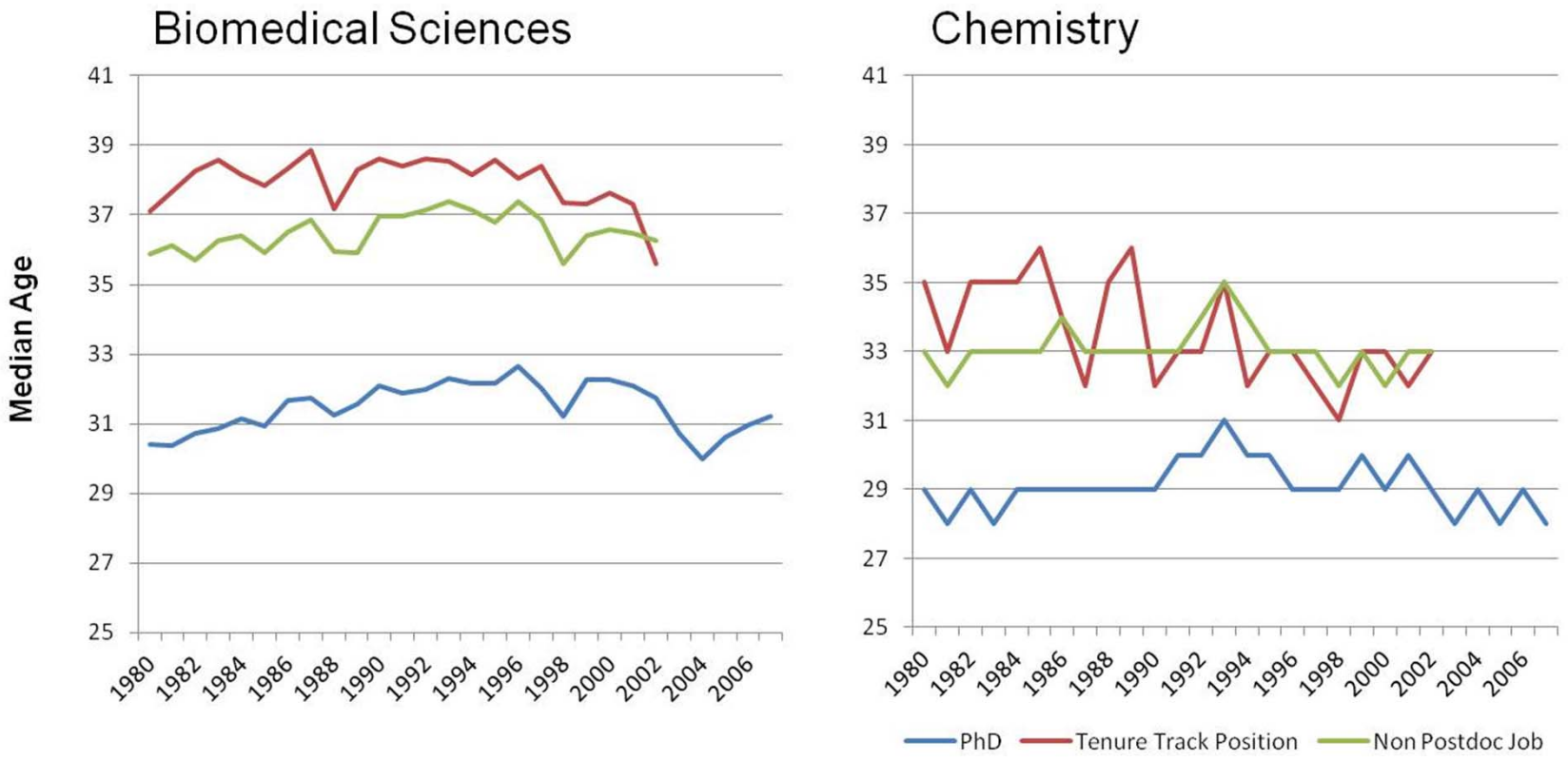
Source: Graduate Students and Postdoctorates Survey

Biomedical Postdoctorates by Citizenship



Source: Graduate Student Survey

Age at First PhD, First Non Postdoctoral Job, First Tenure Track Job, for US trained Doctorates



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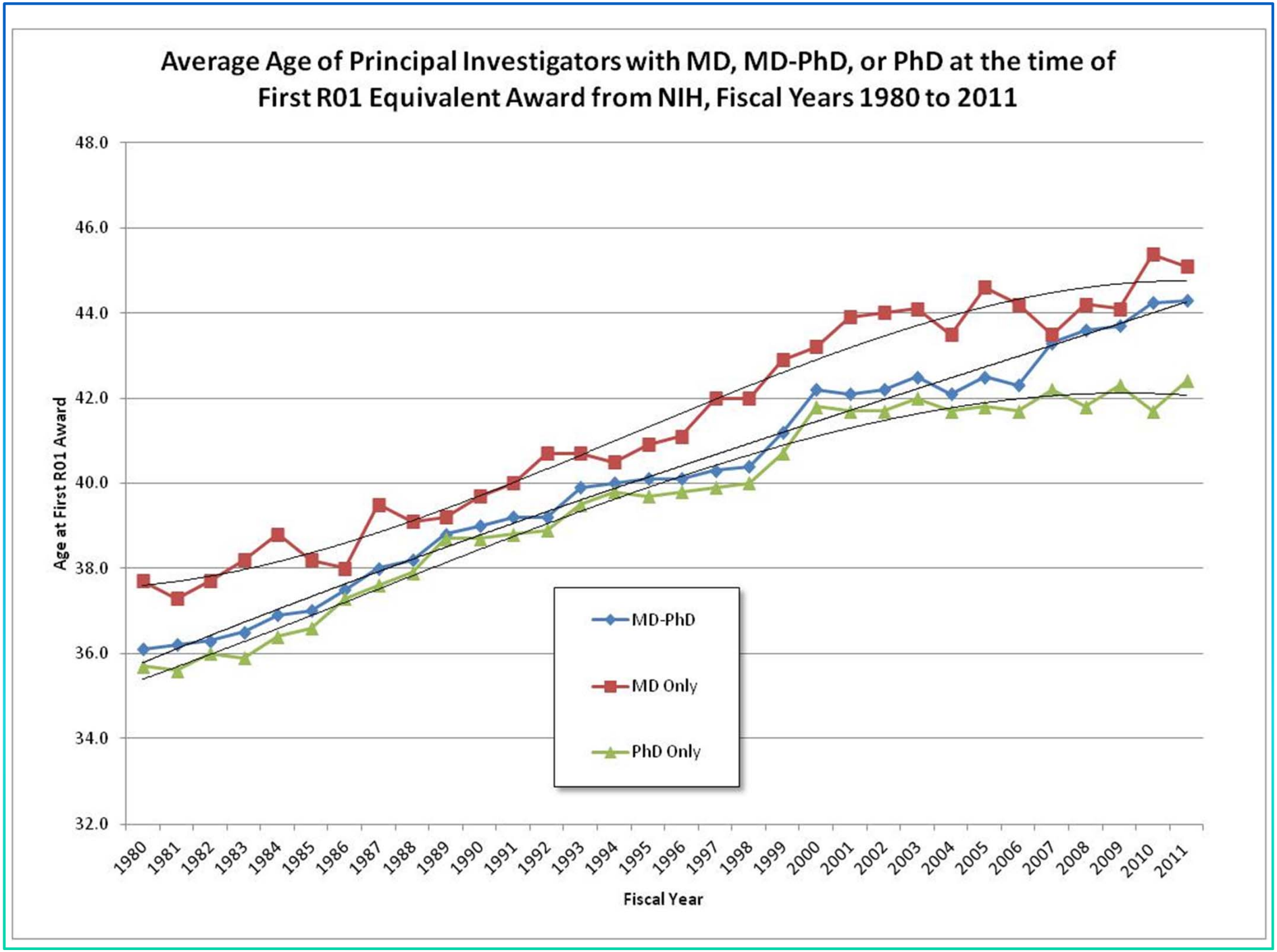
Average Age of Principal Investigators with MD, MD-PhD, or PhD at the time of First R01 Equivalent Award from NIH, Fiscal Years 1980 to 2011
Age at First R01 Award
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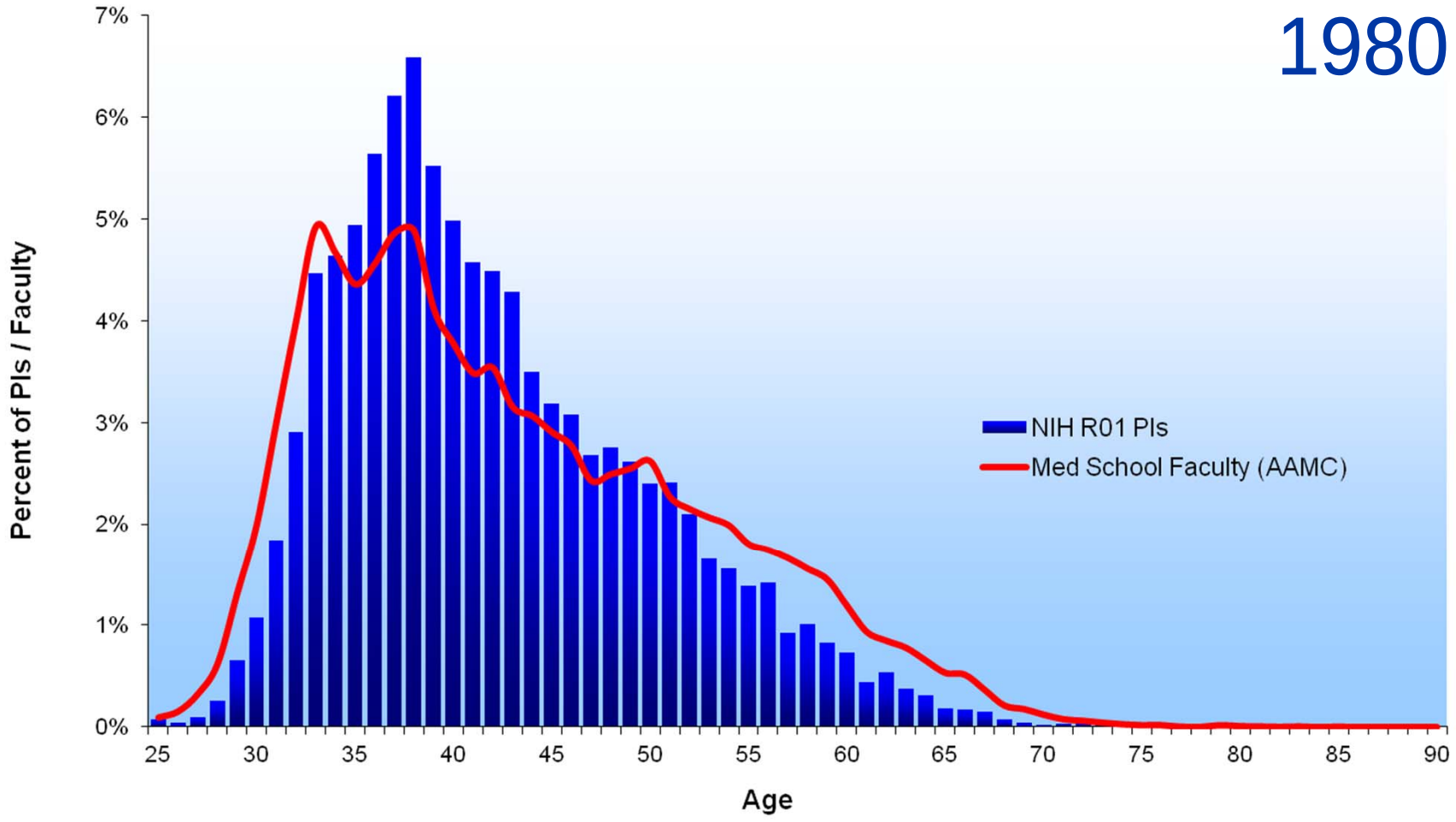
PhD Only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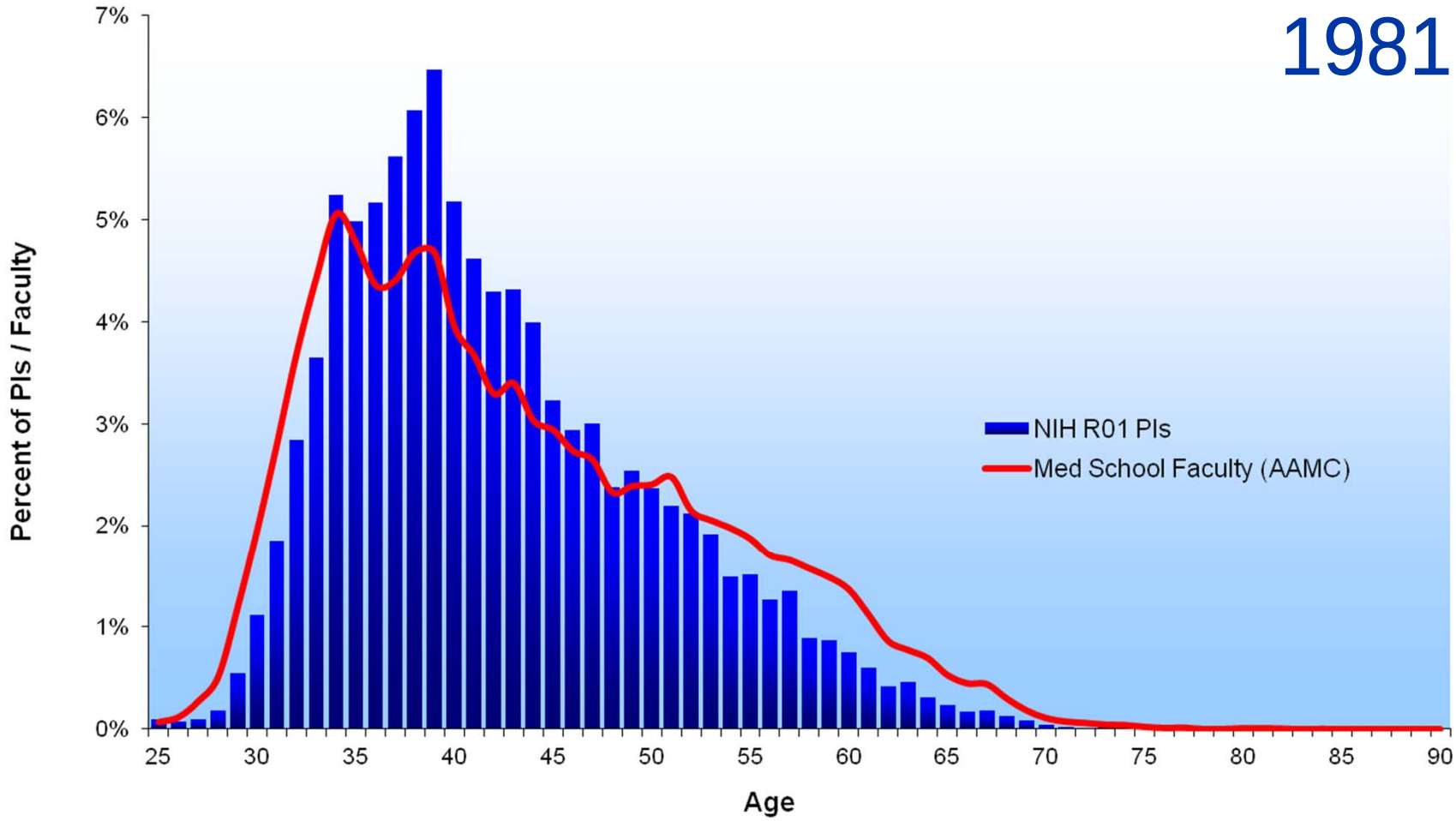
Med School Faculty (AAMC)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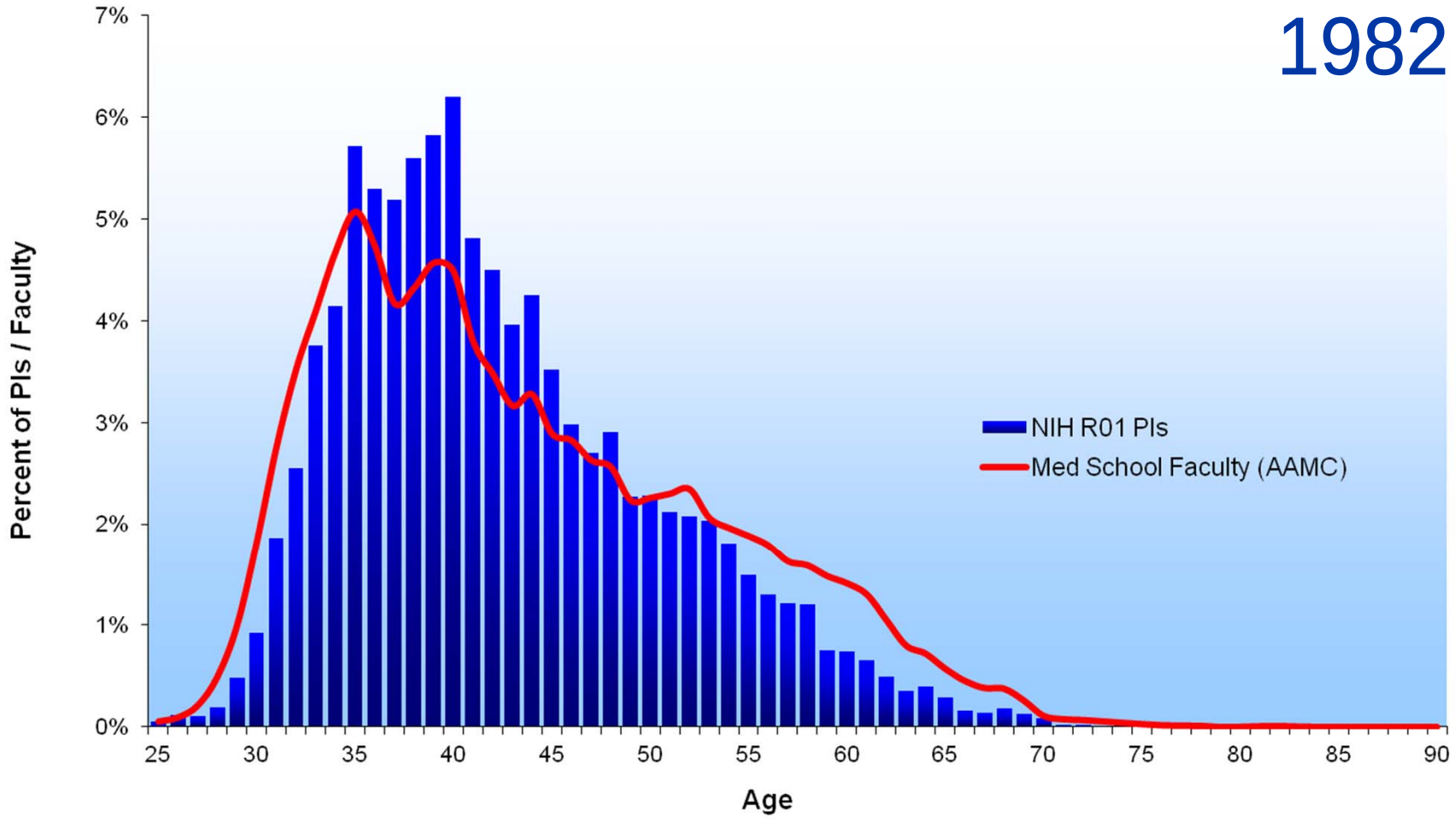
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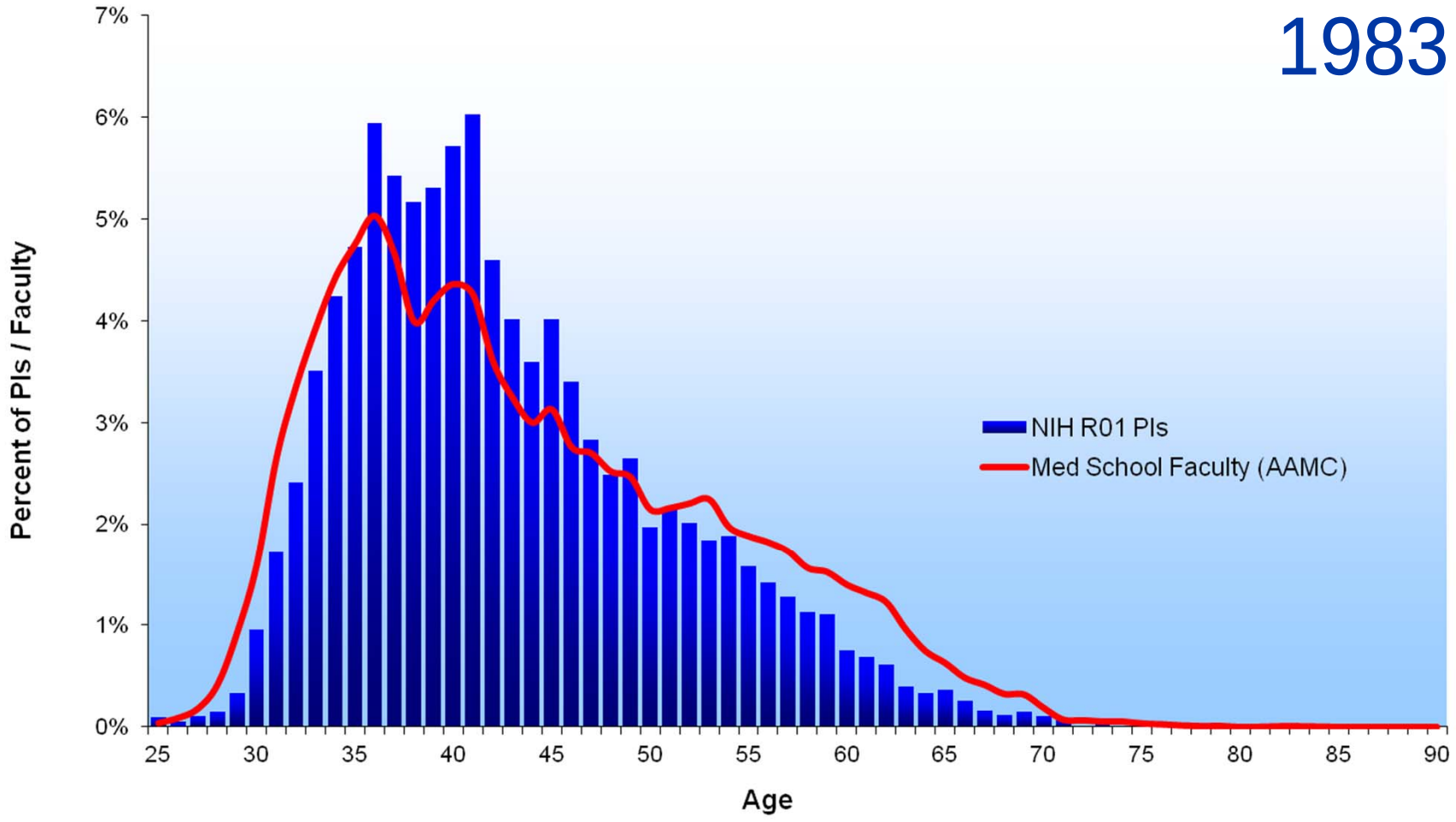
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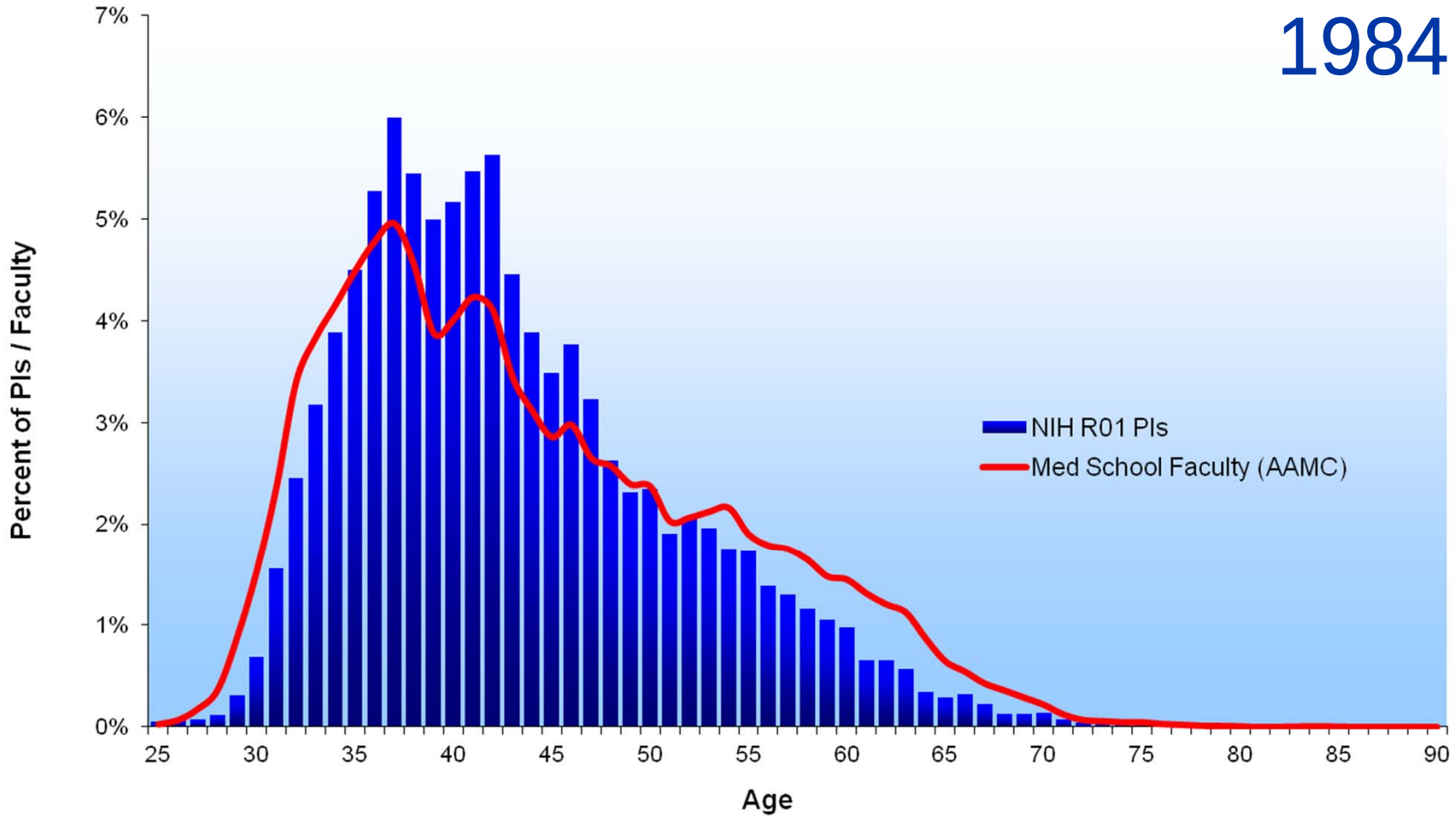
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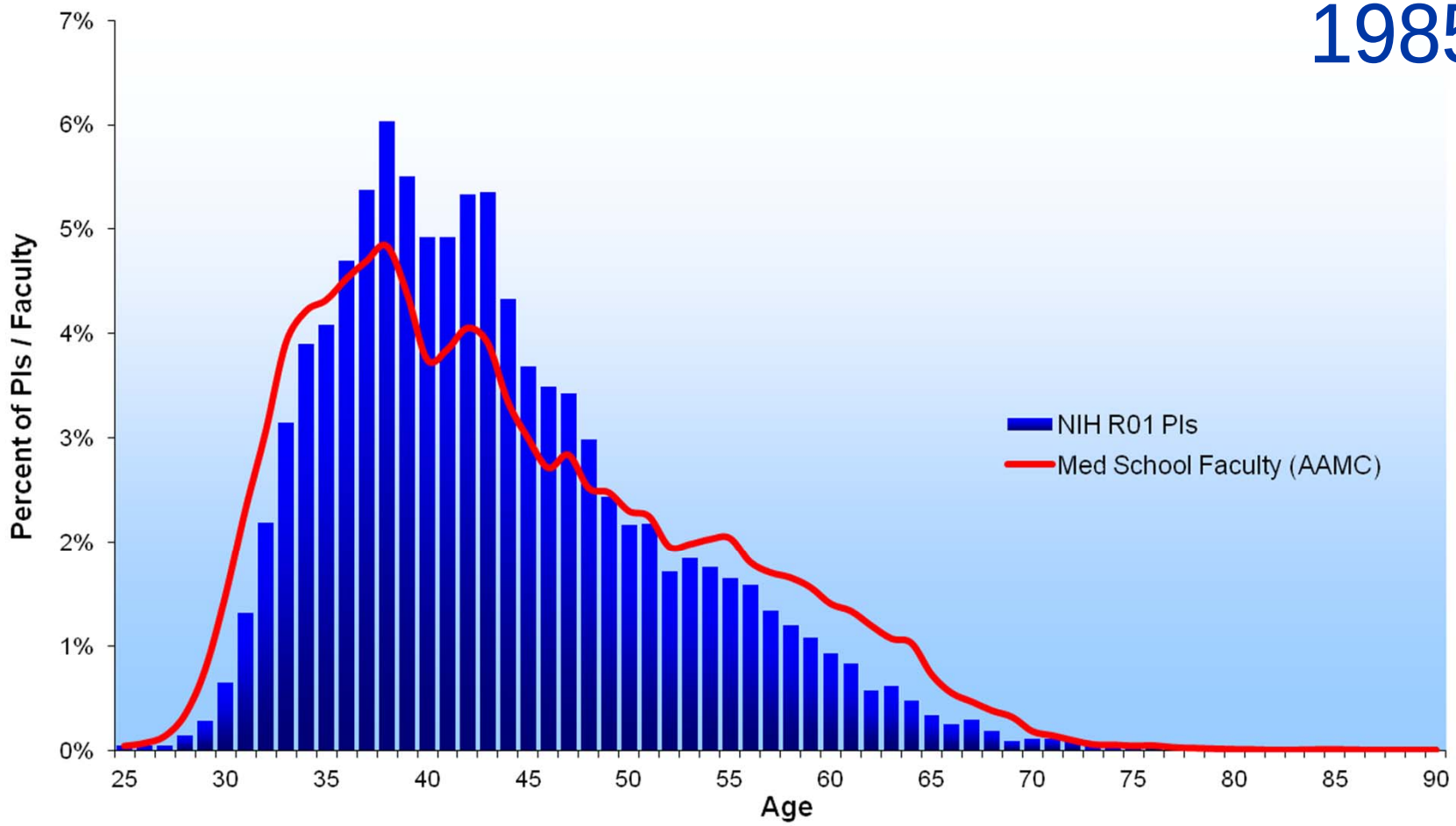
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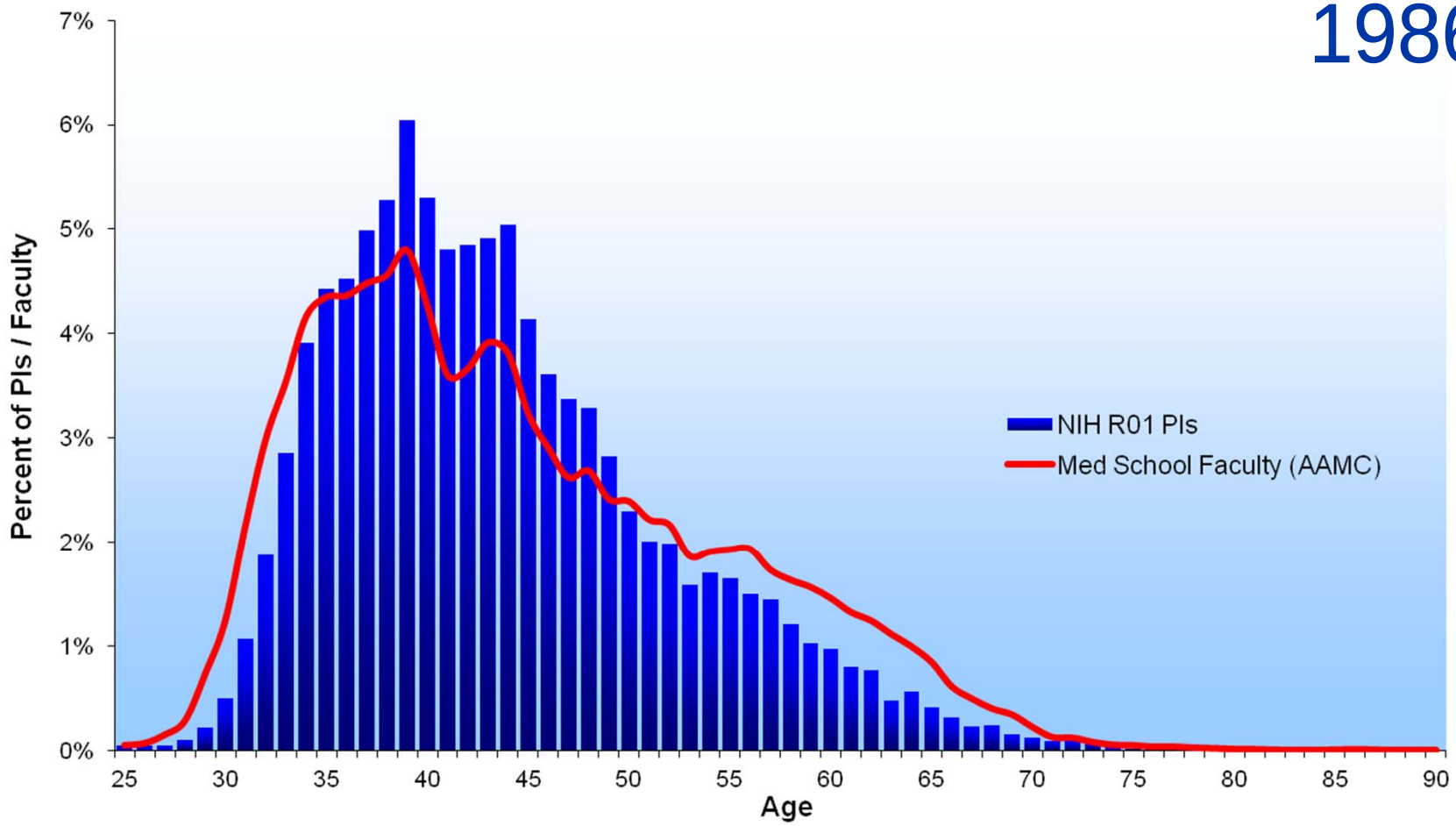
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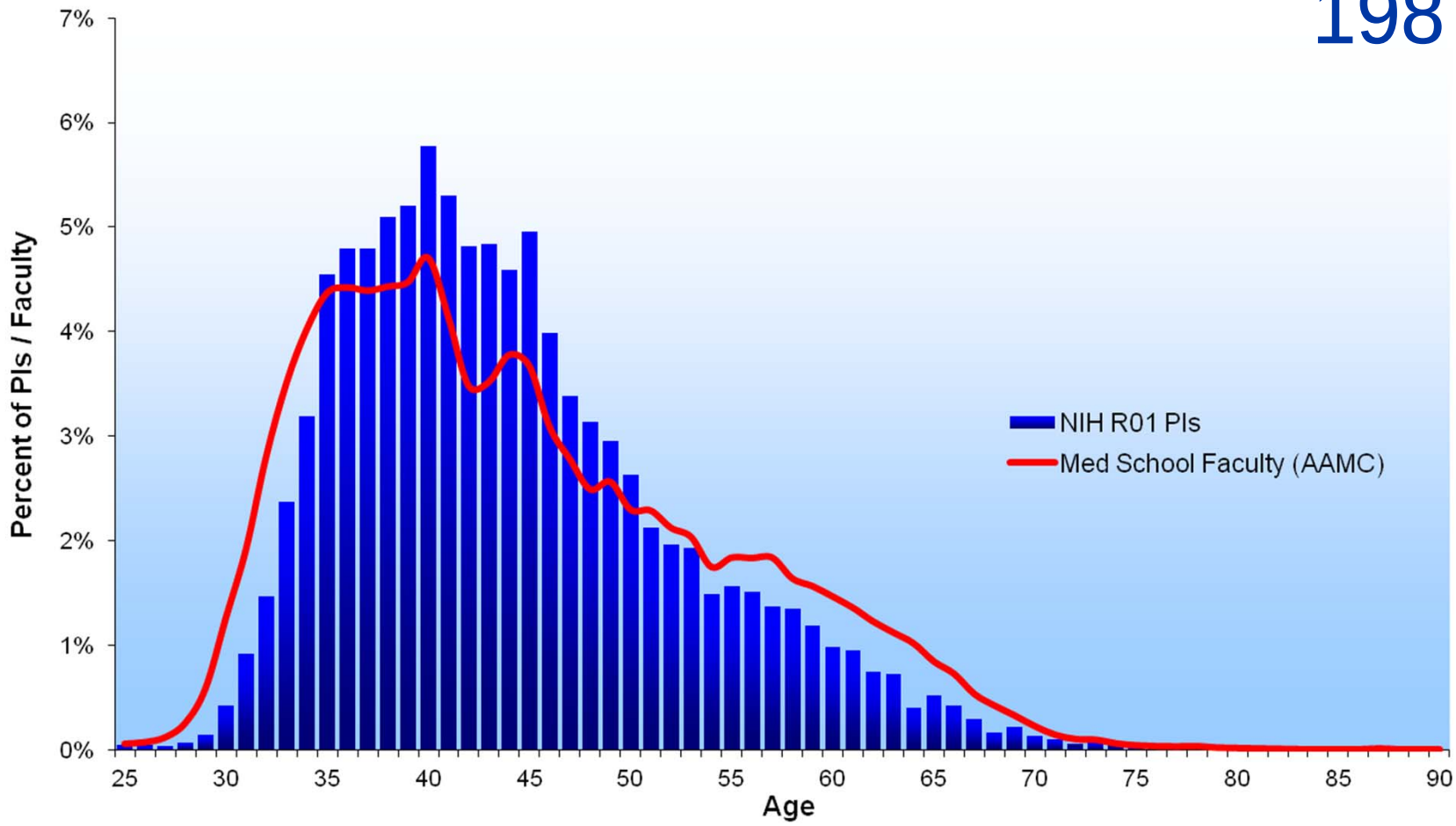
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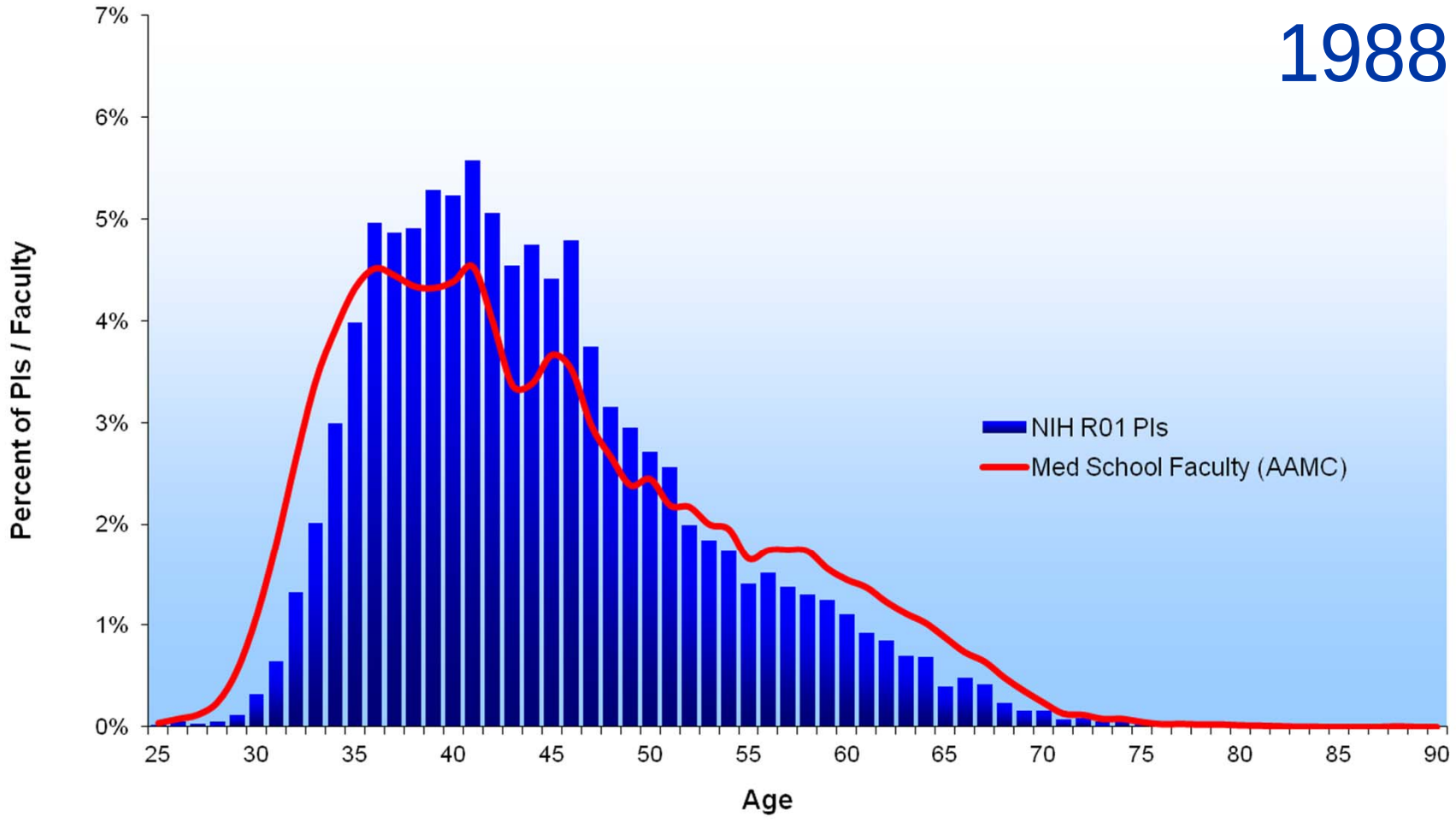
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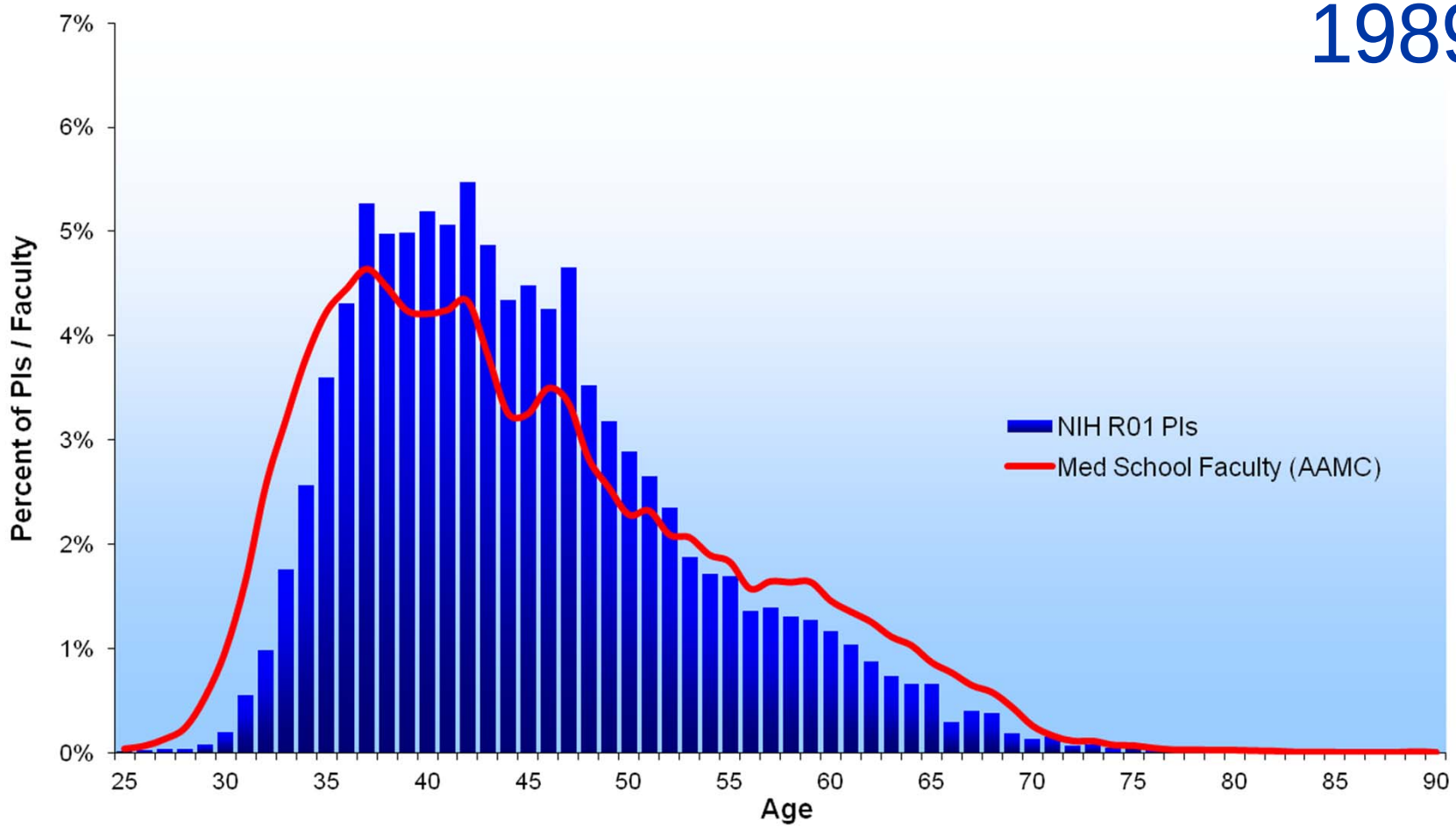
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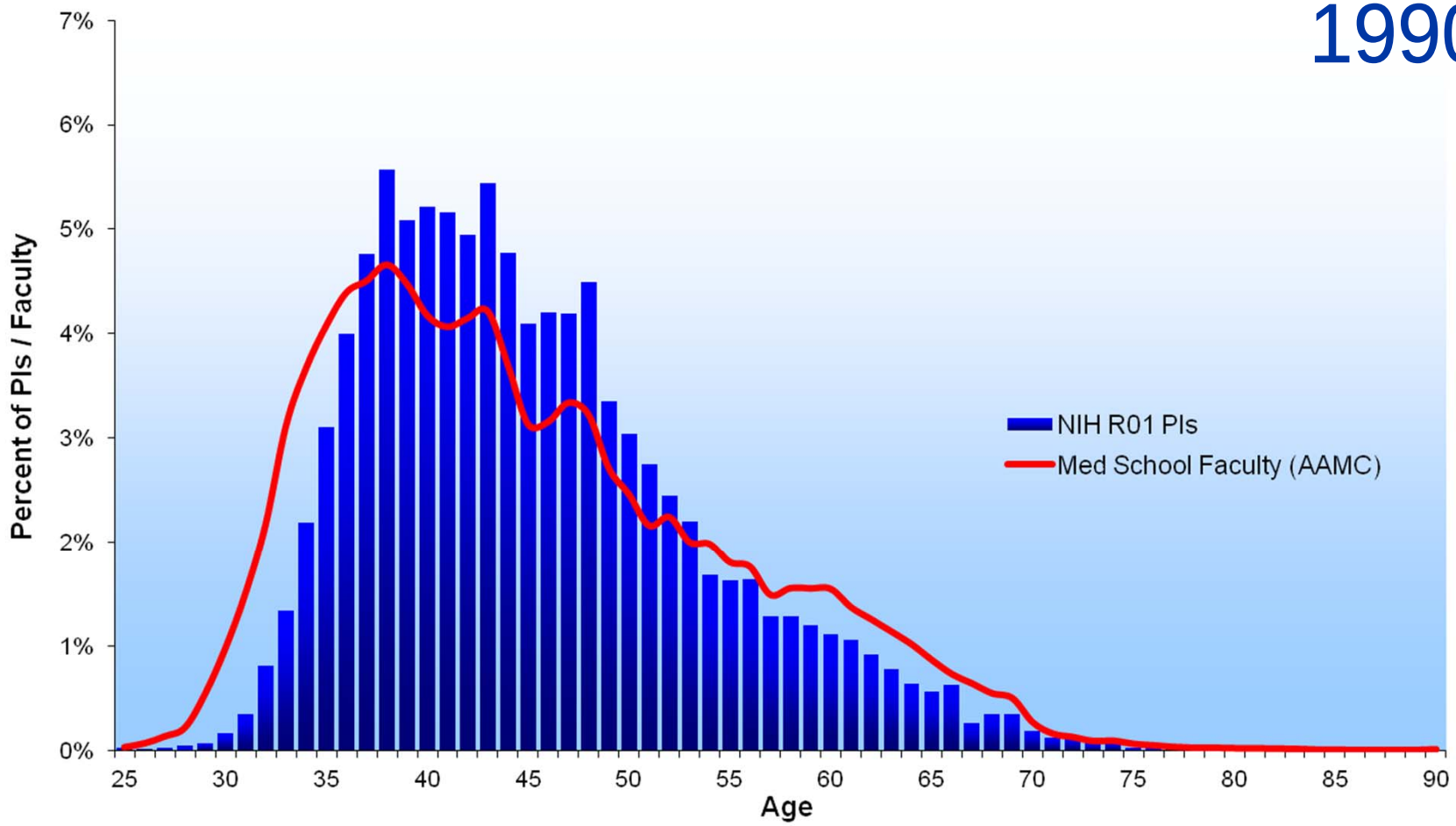
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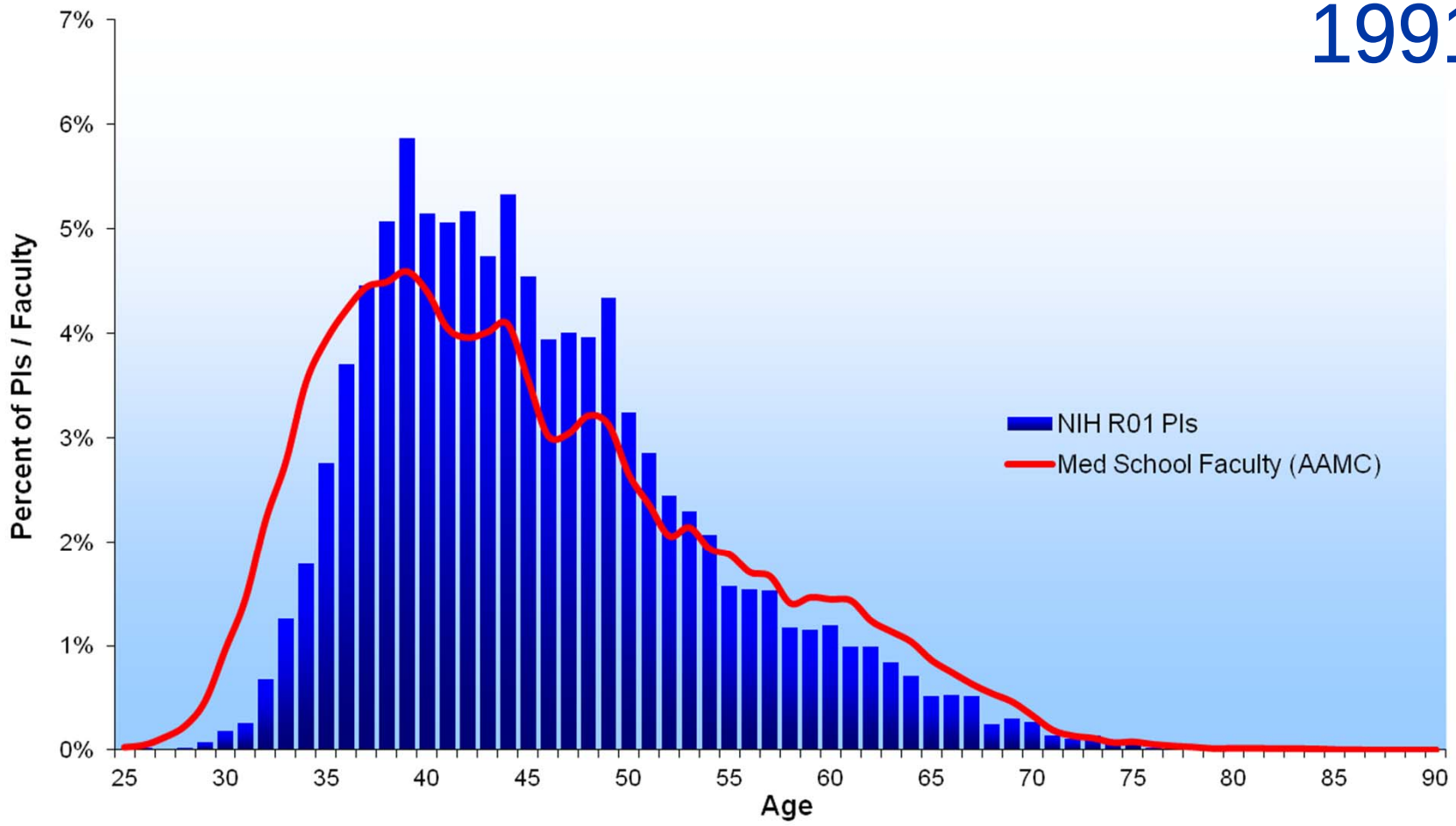
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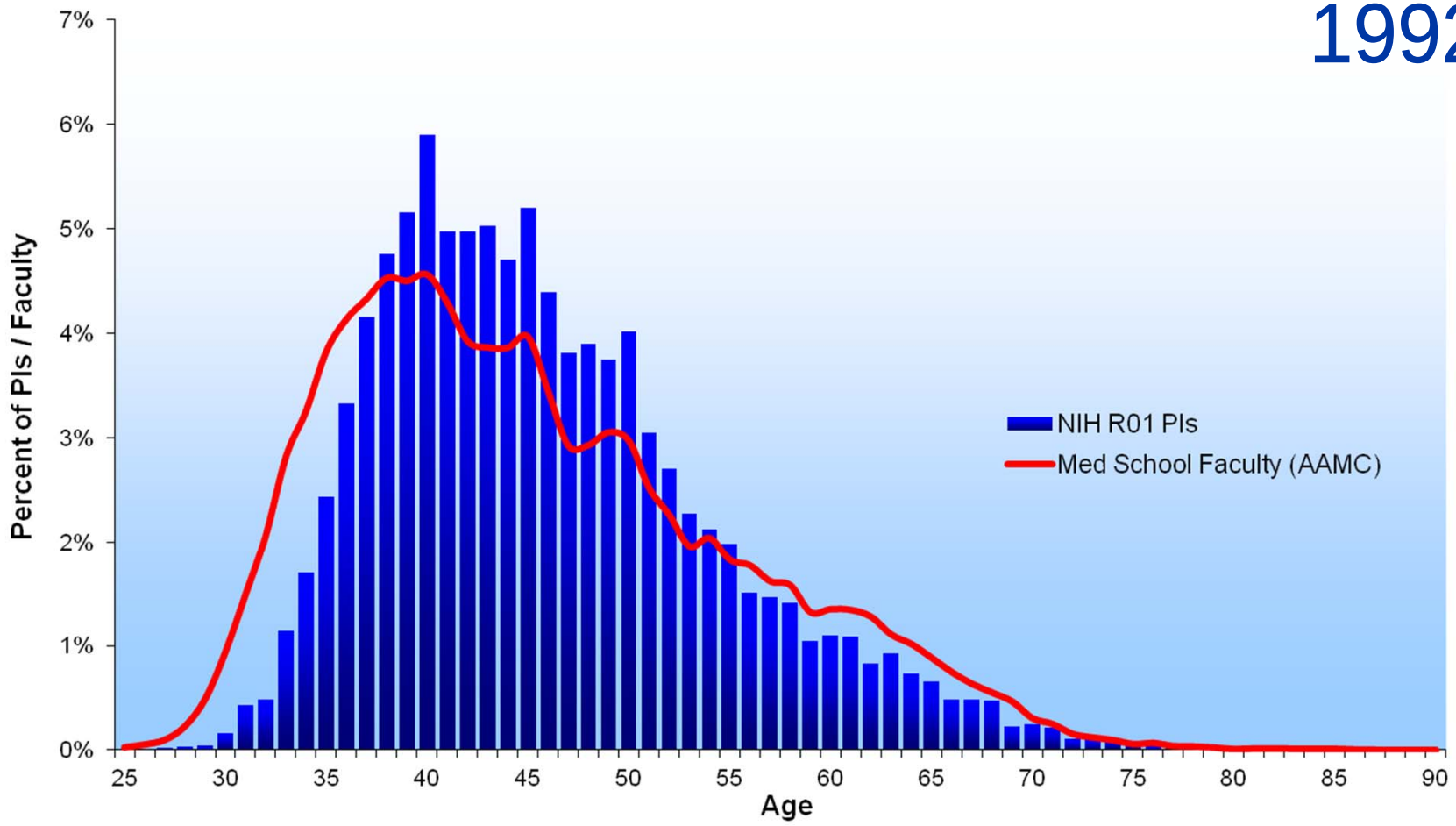
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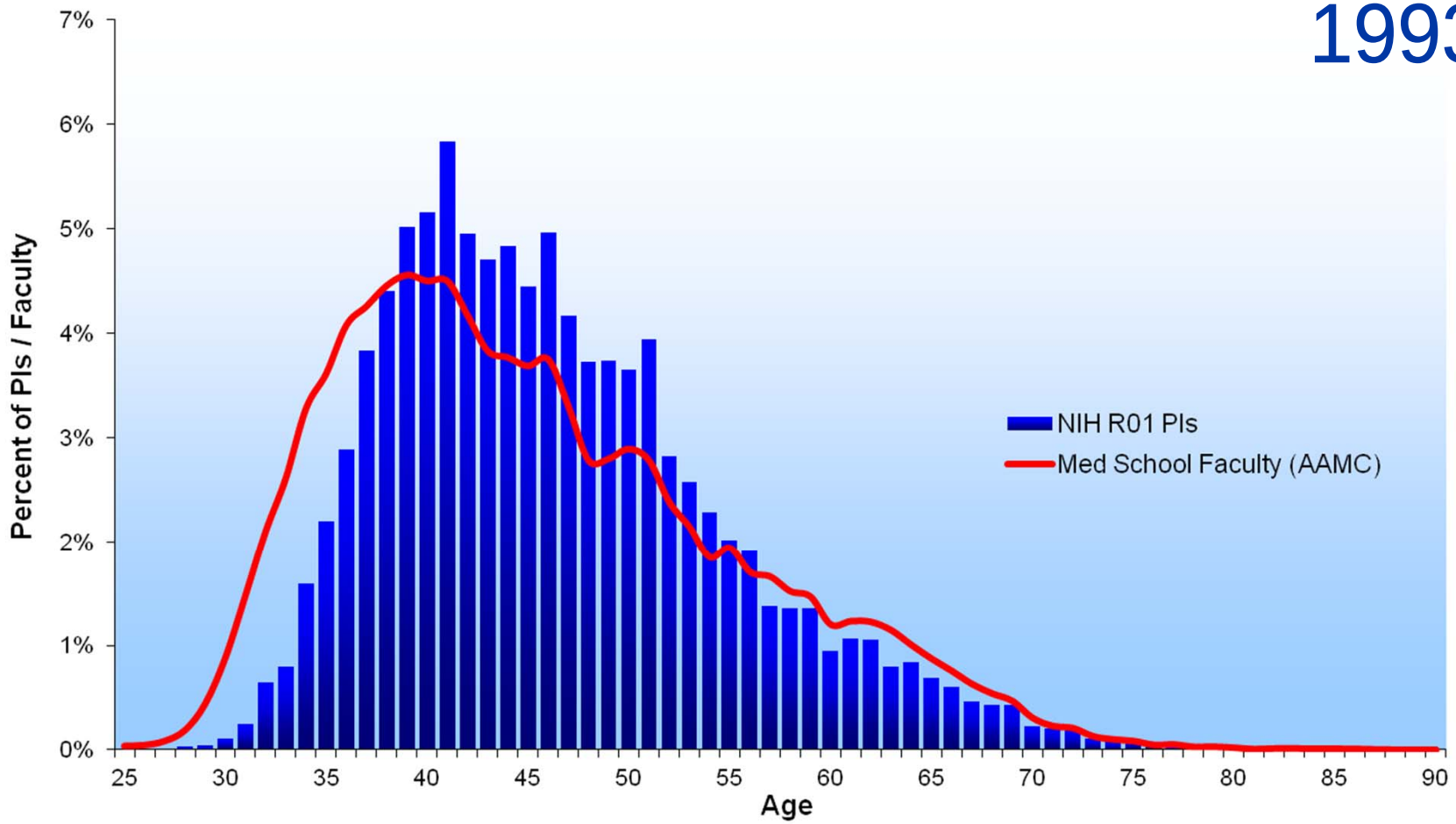
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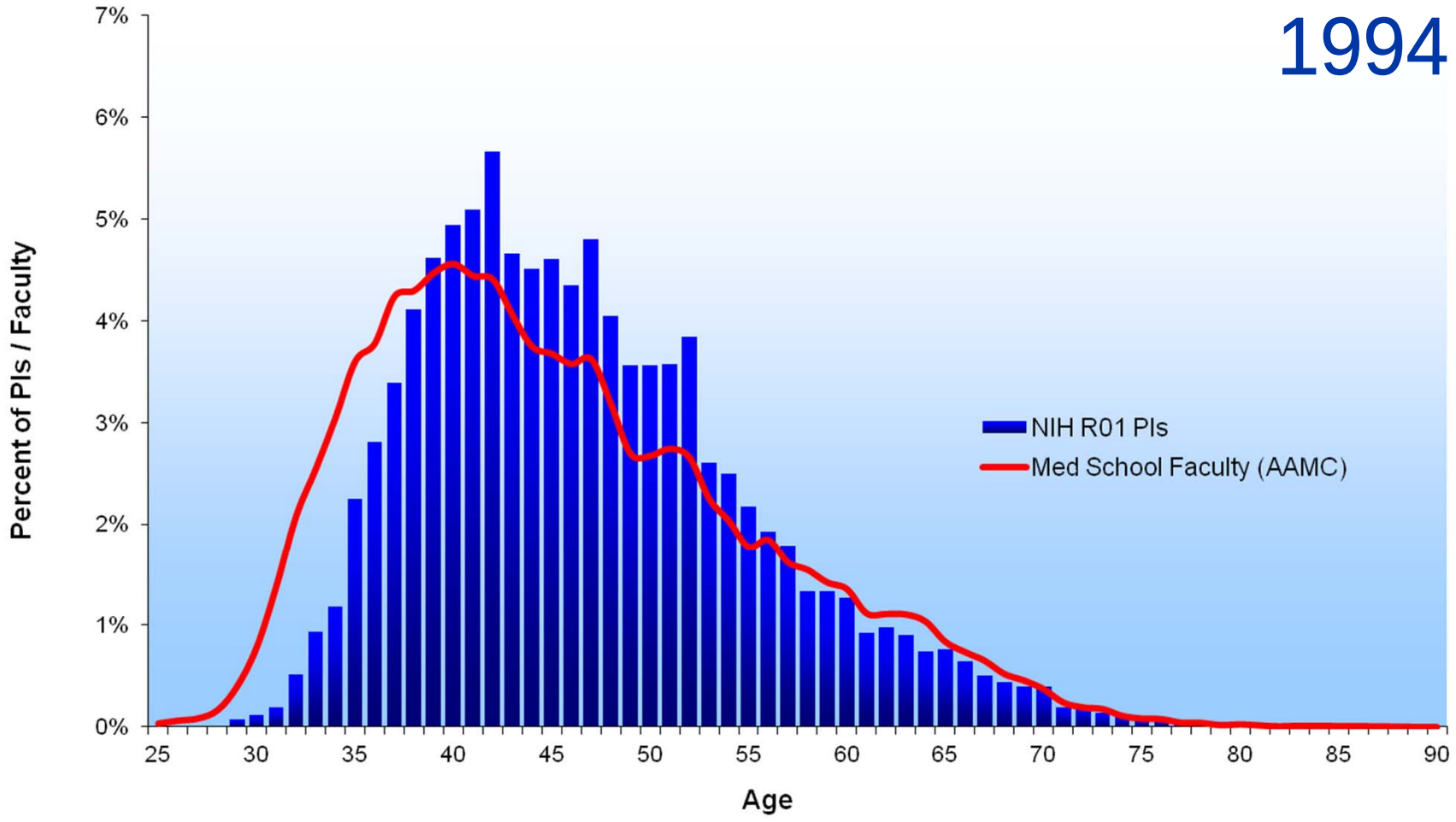
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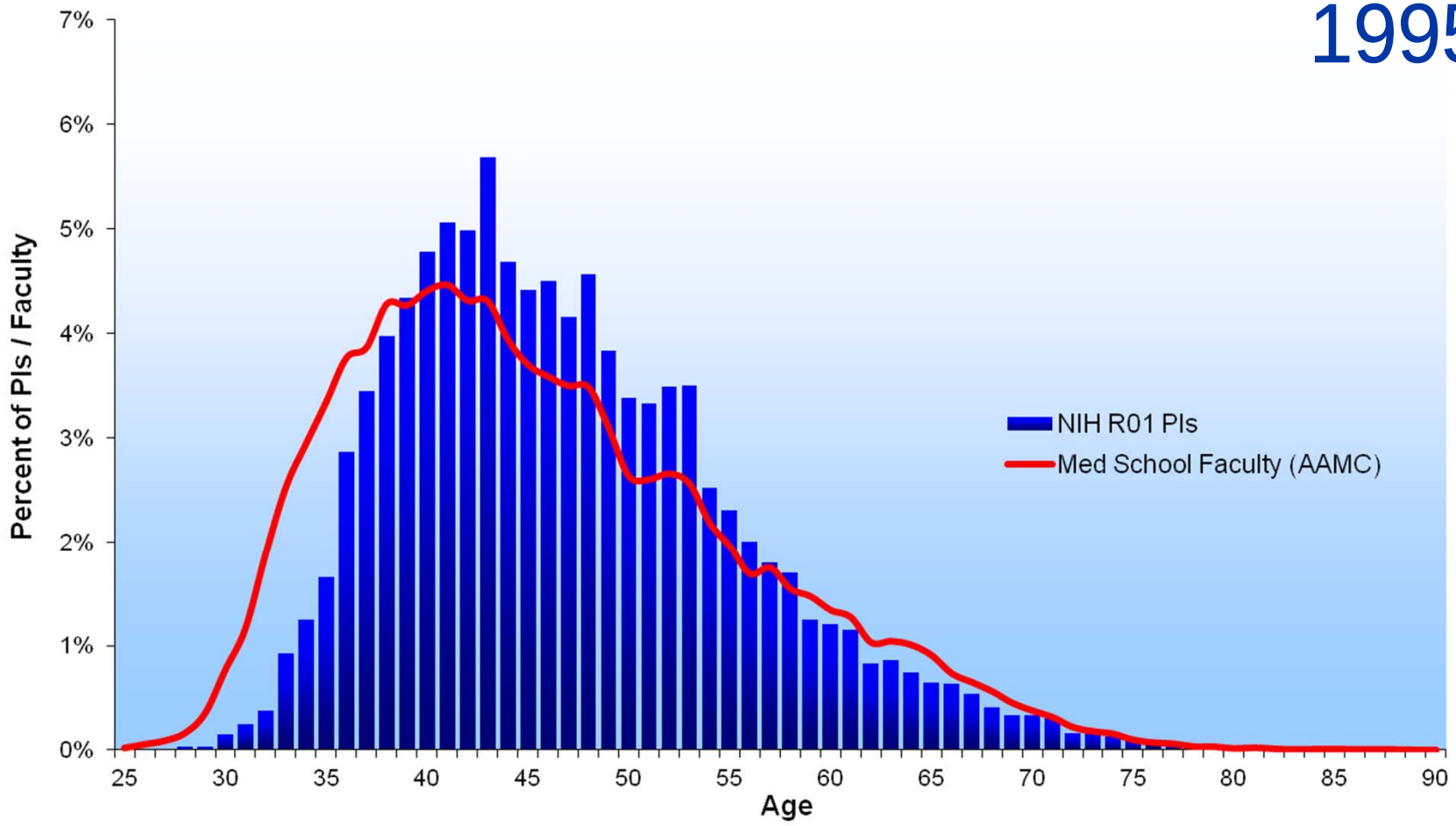
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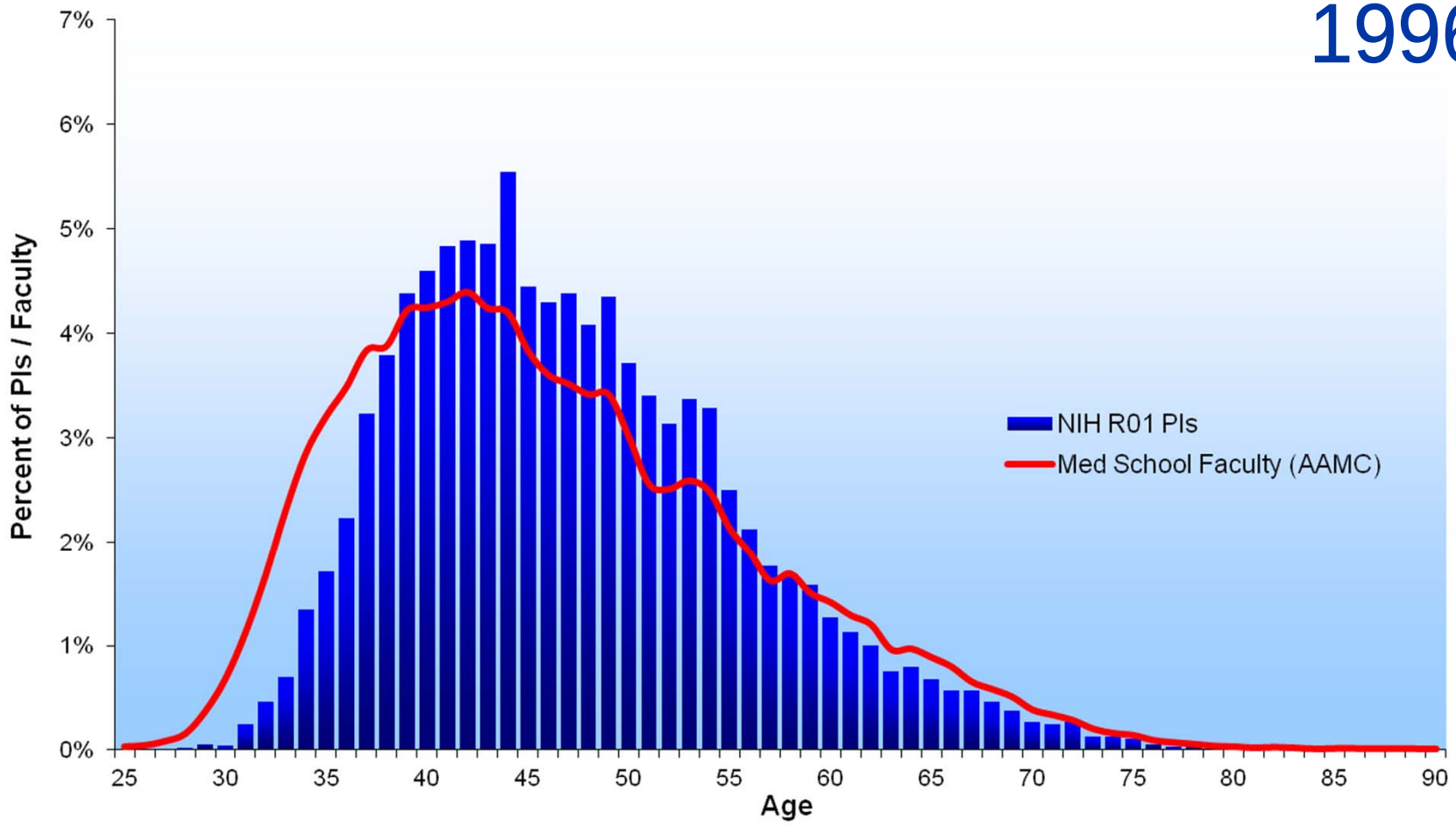
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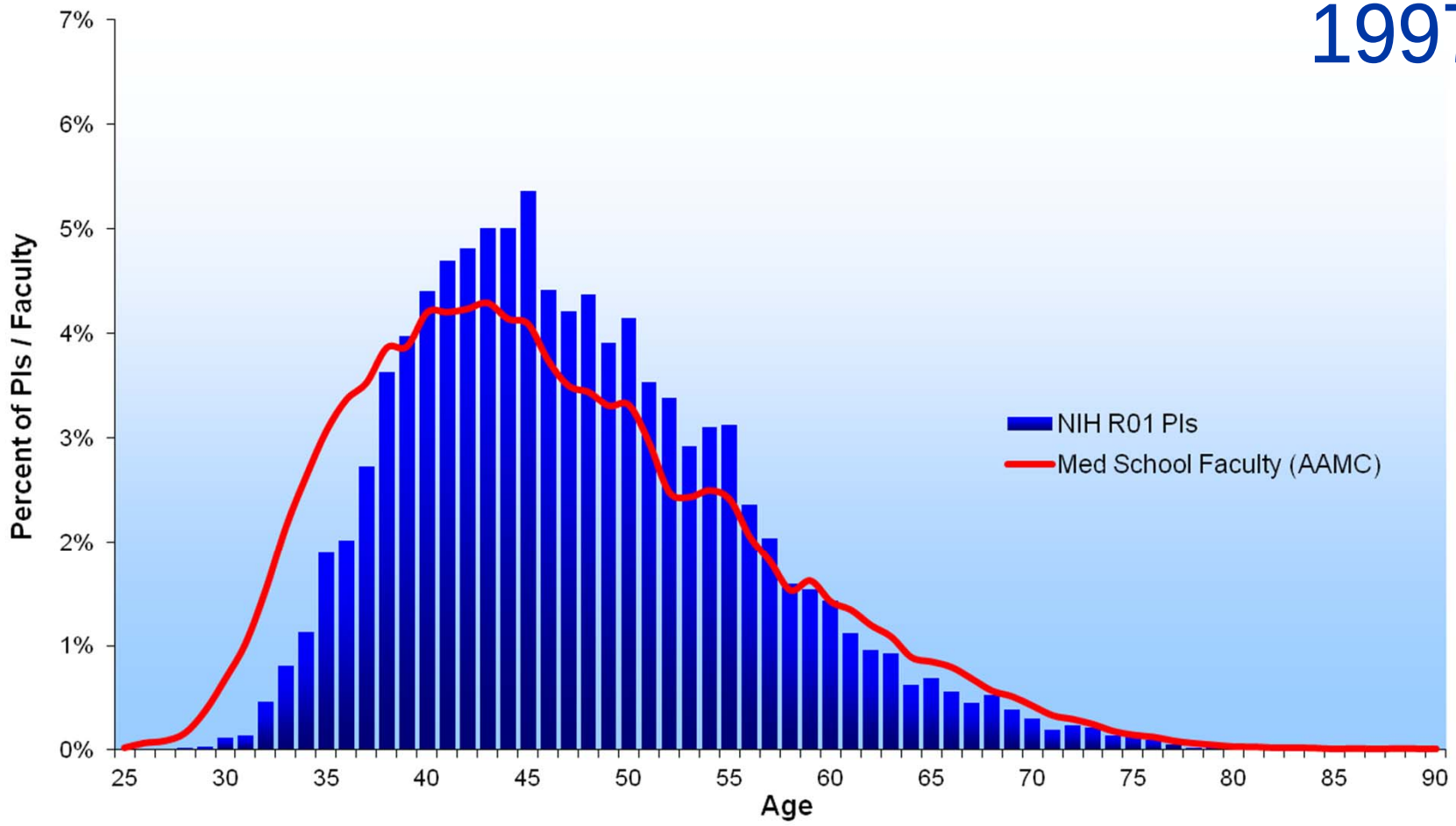
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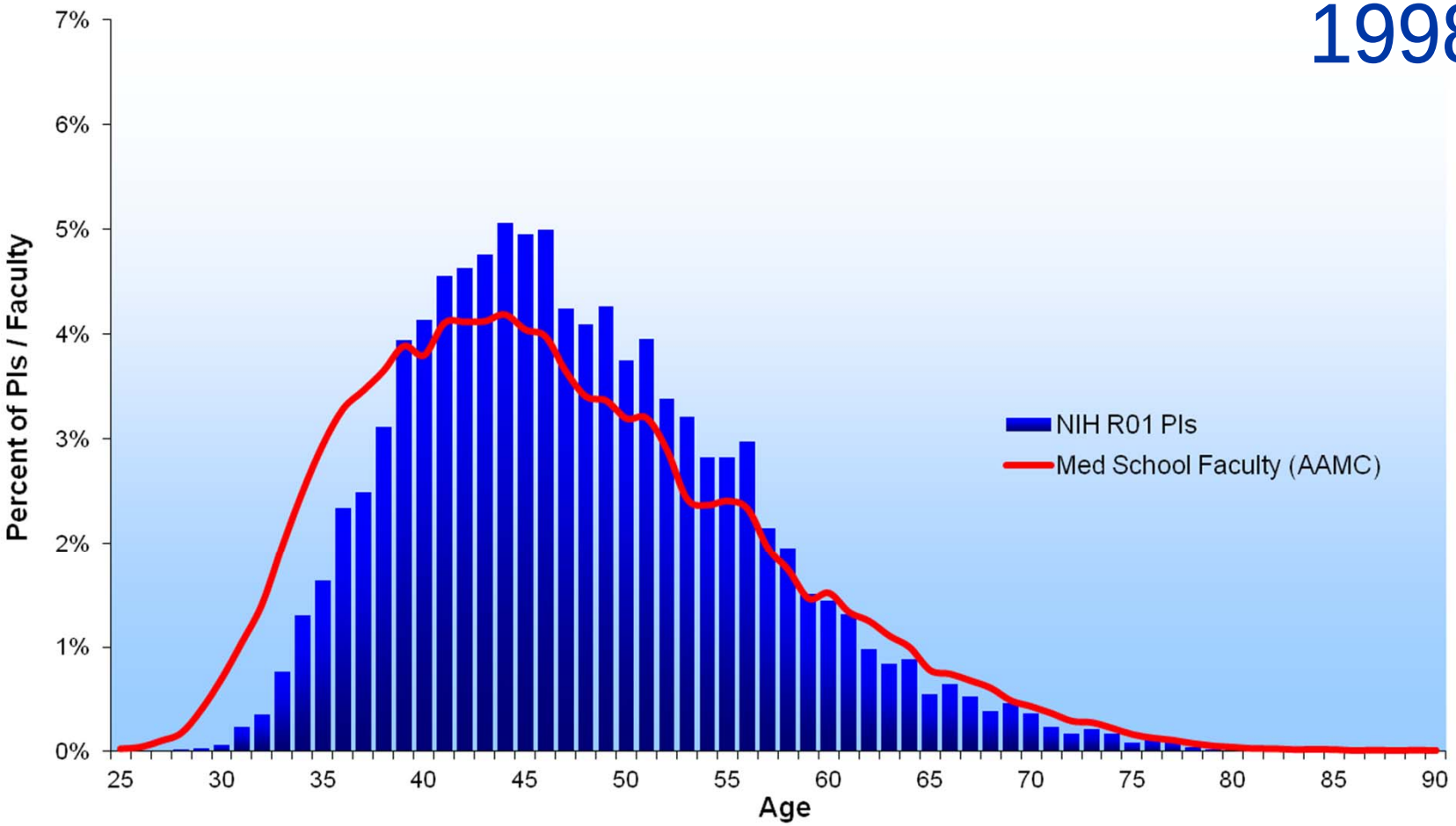
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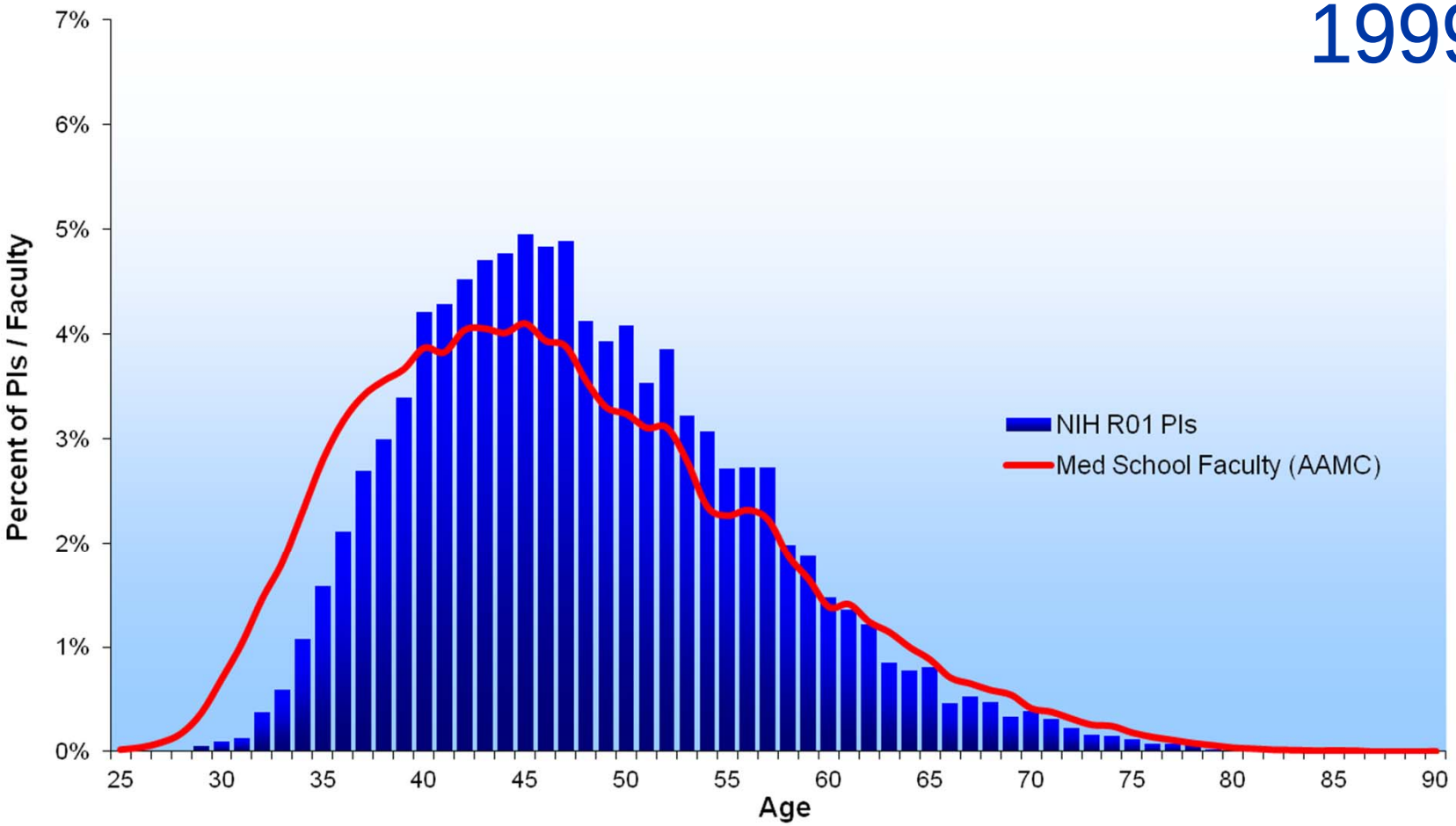
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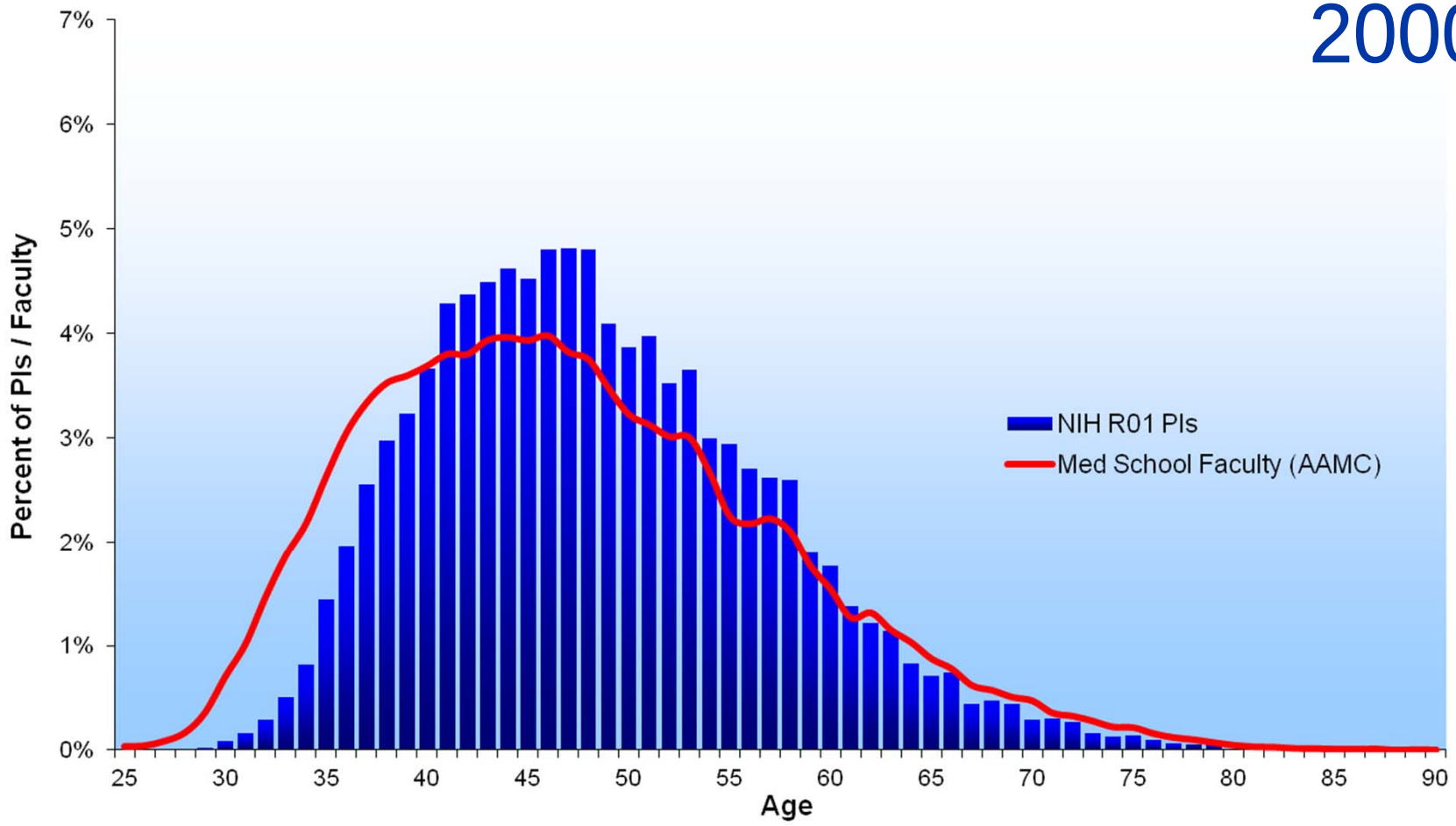
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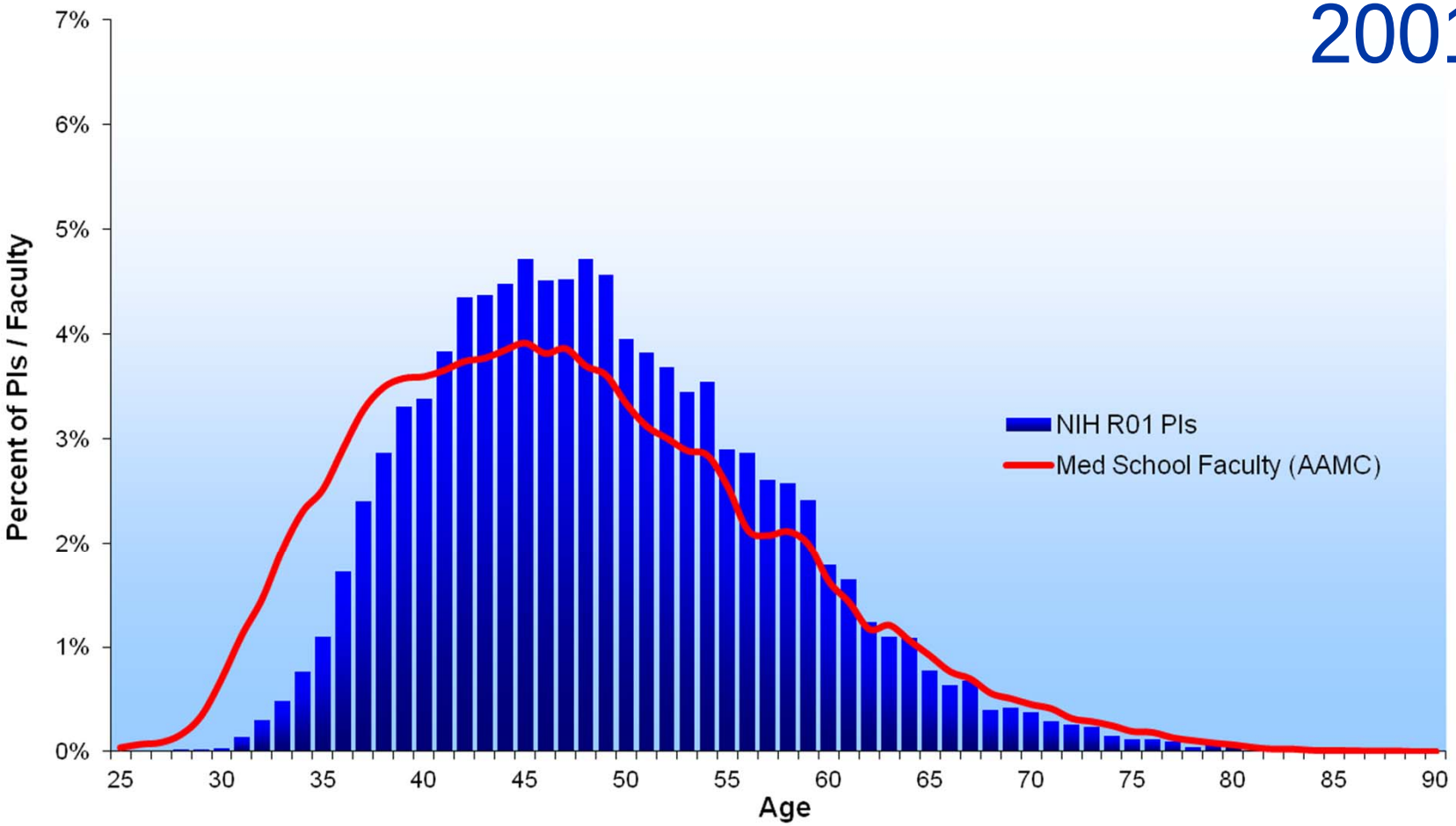
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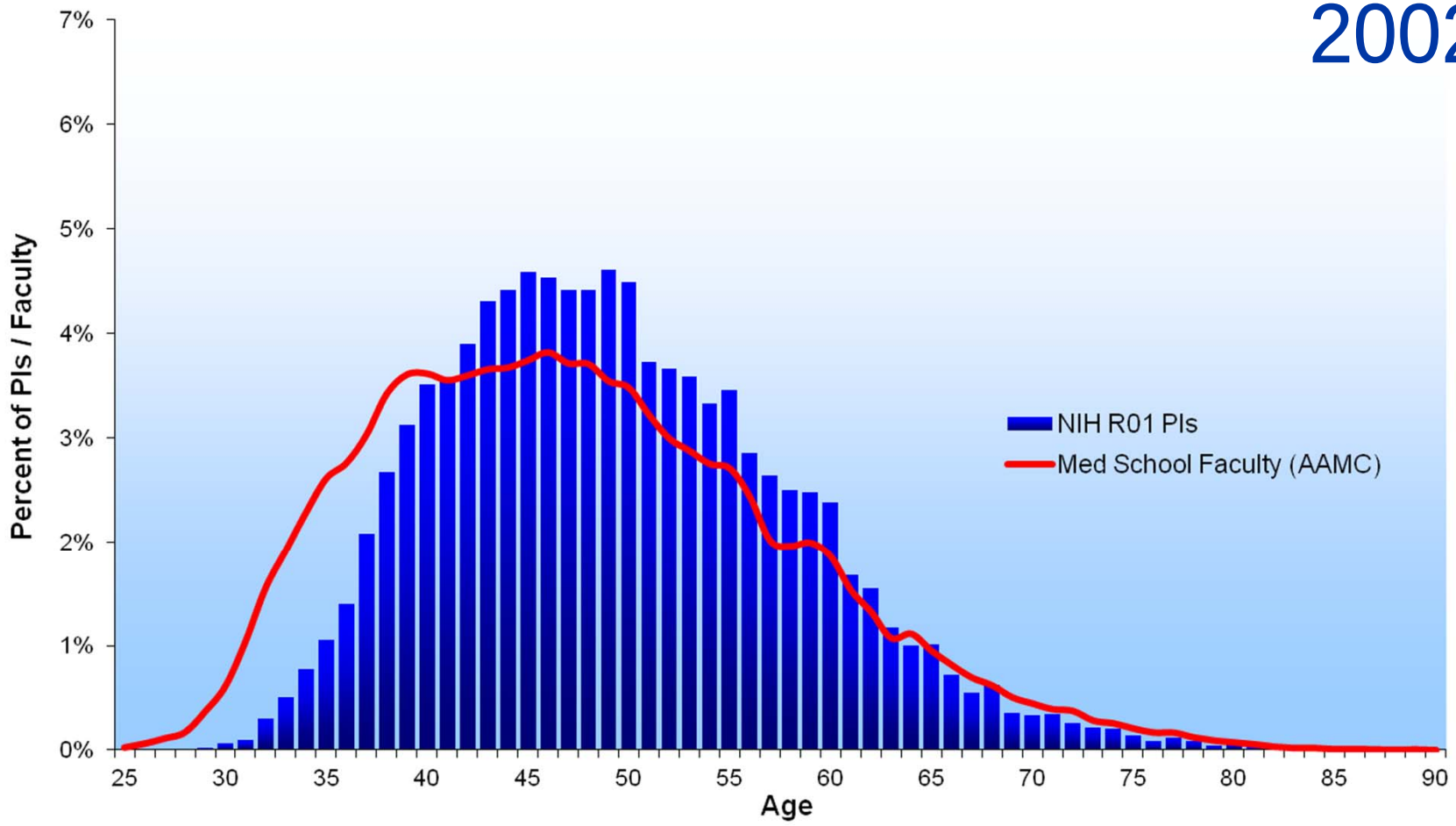
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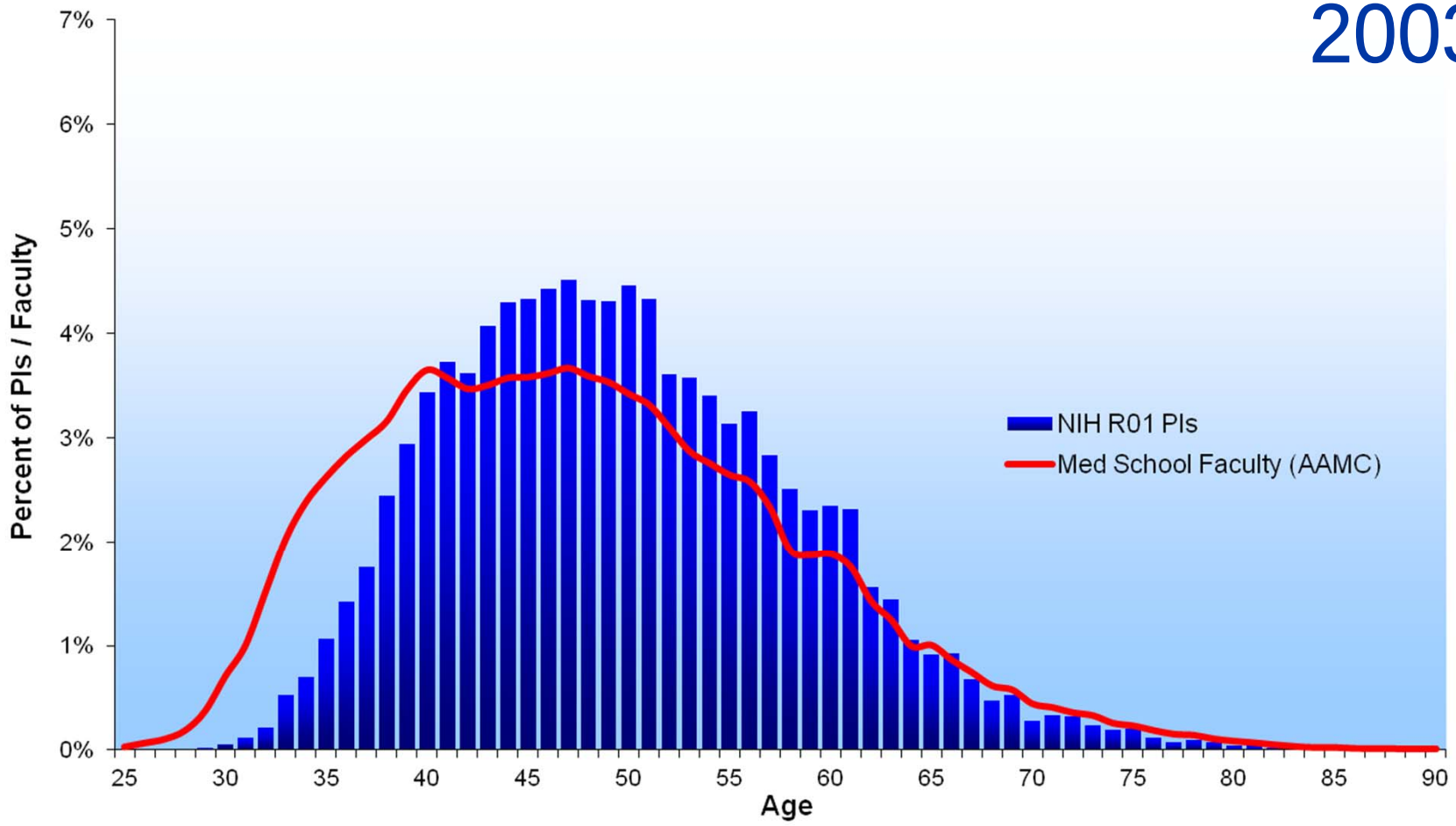
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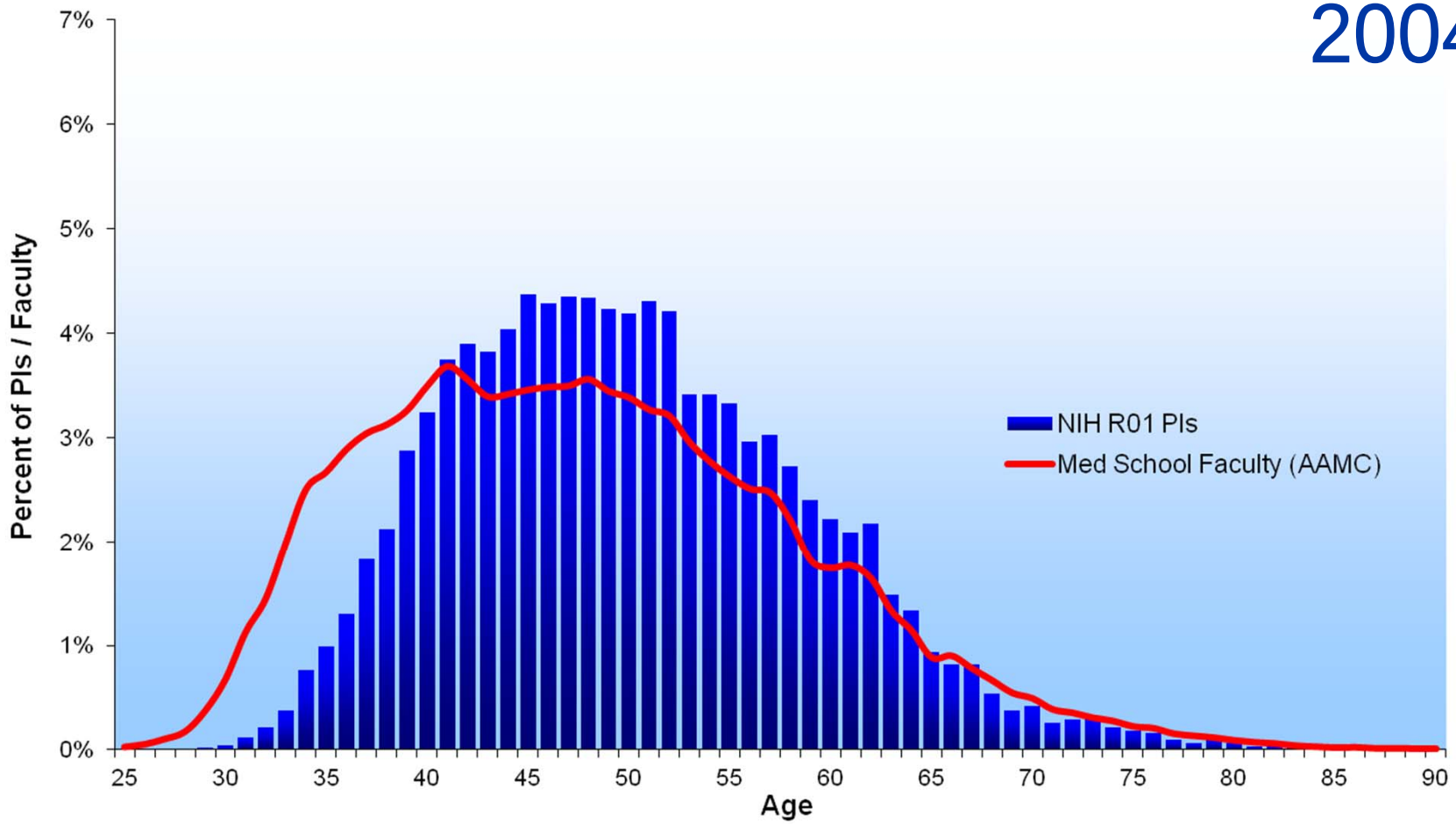
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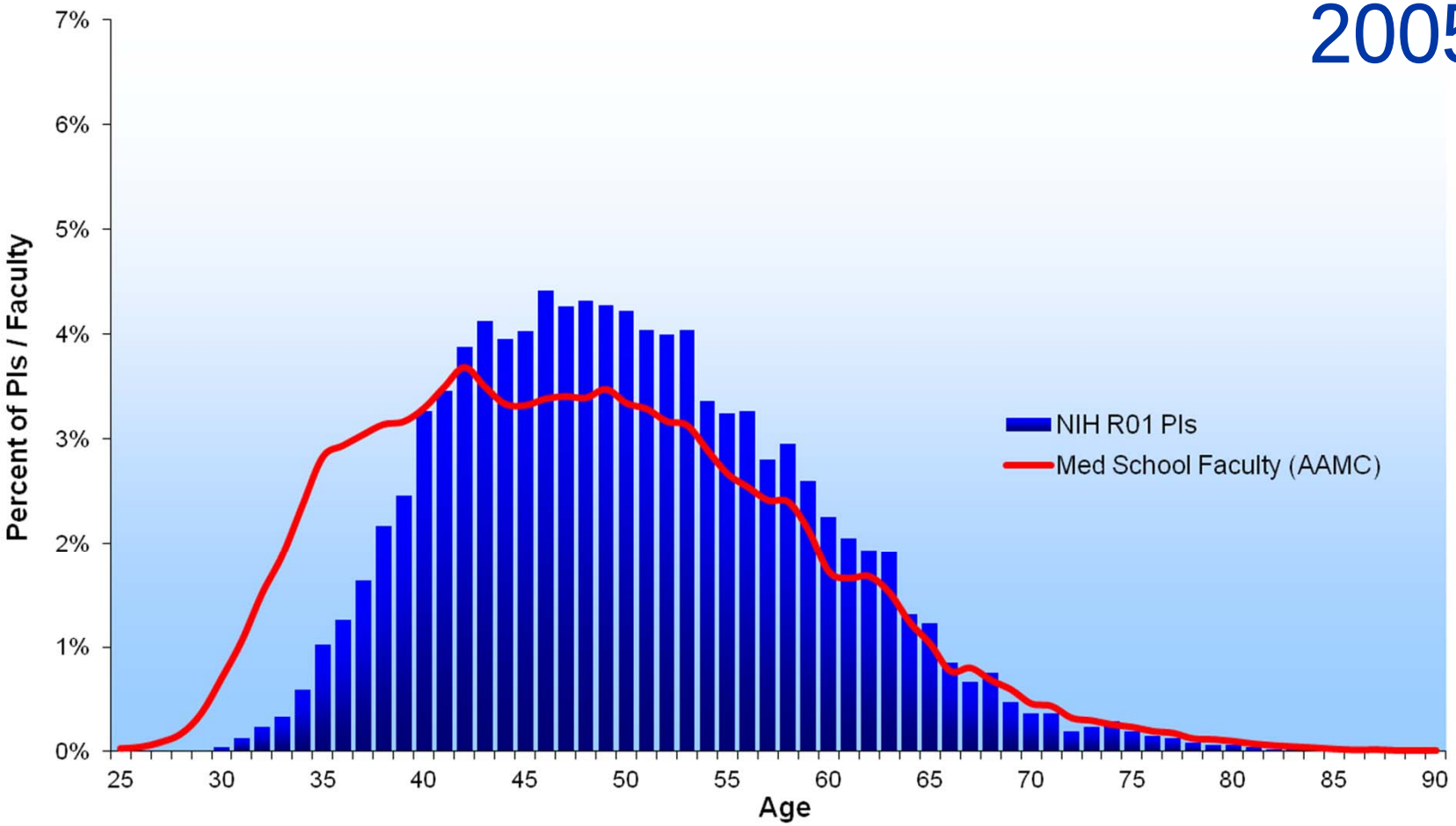
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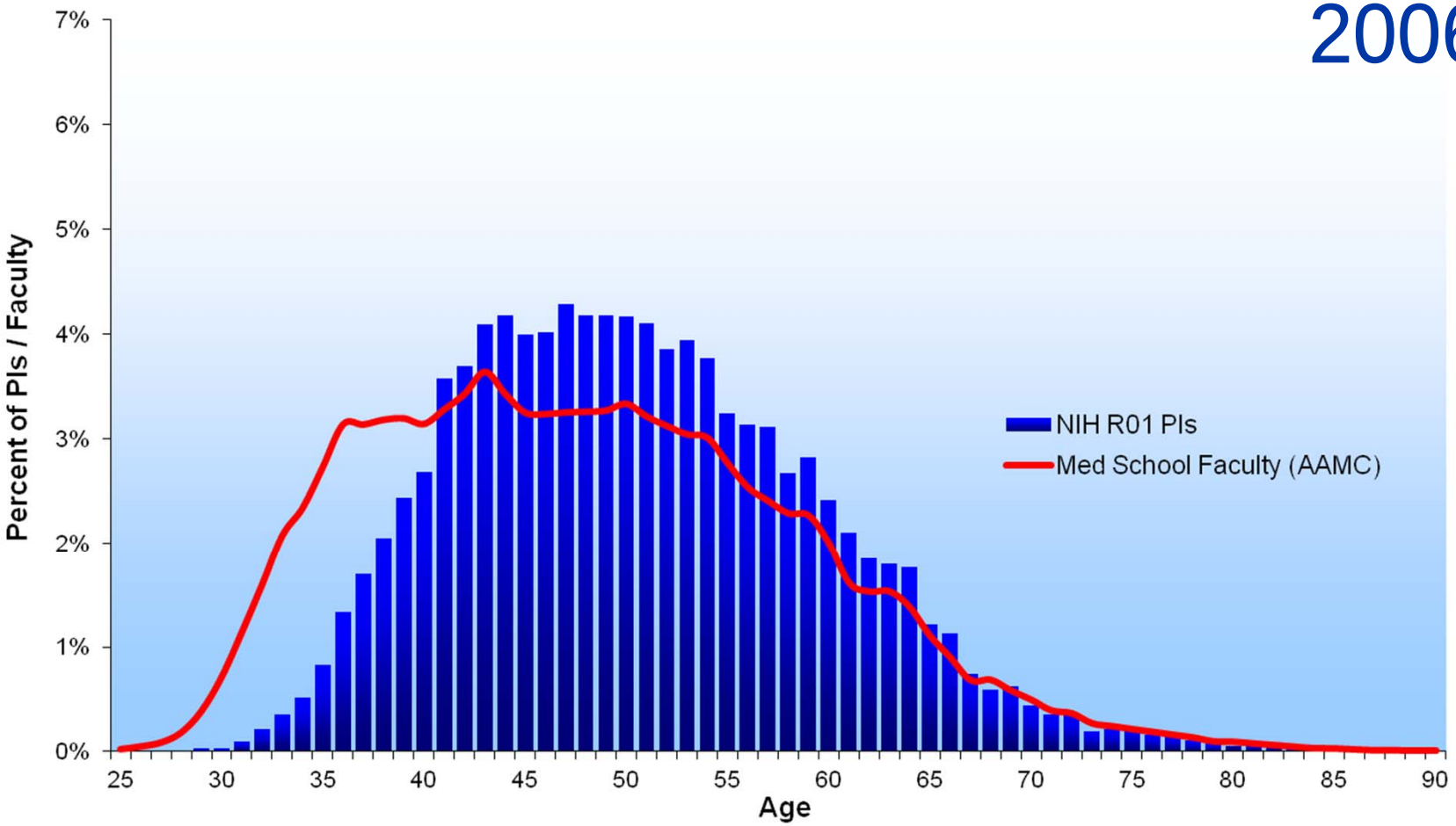
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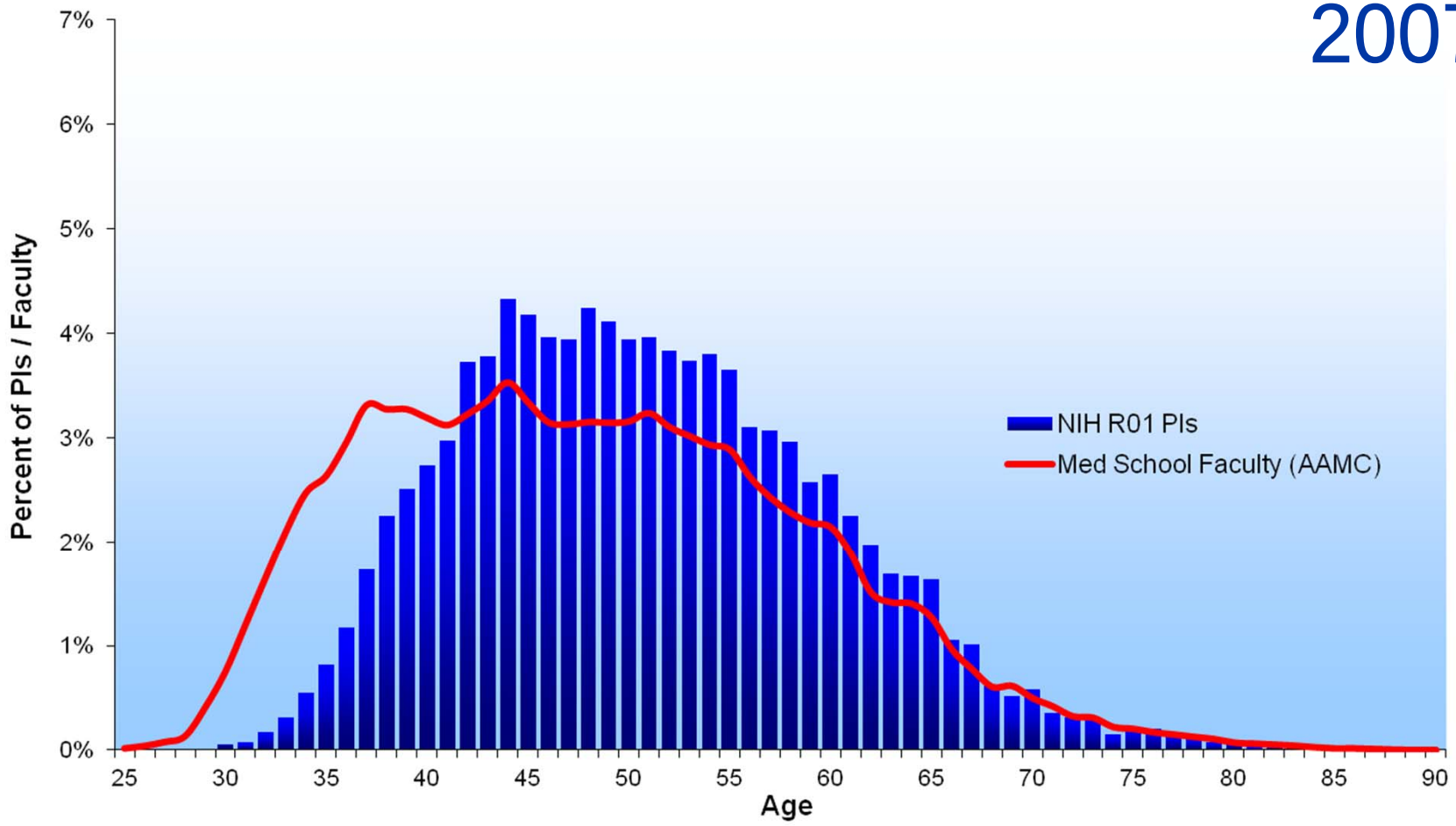
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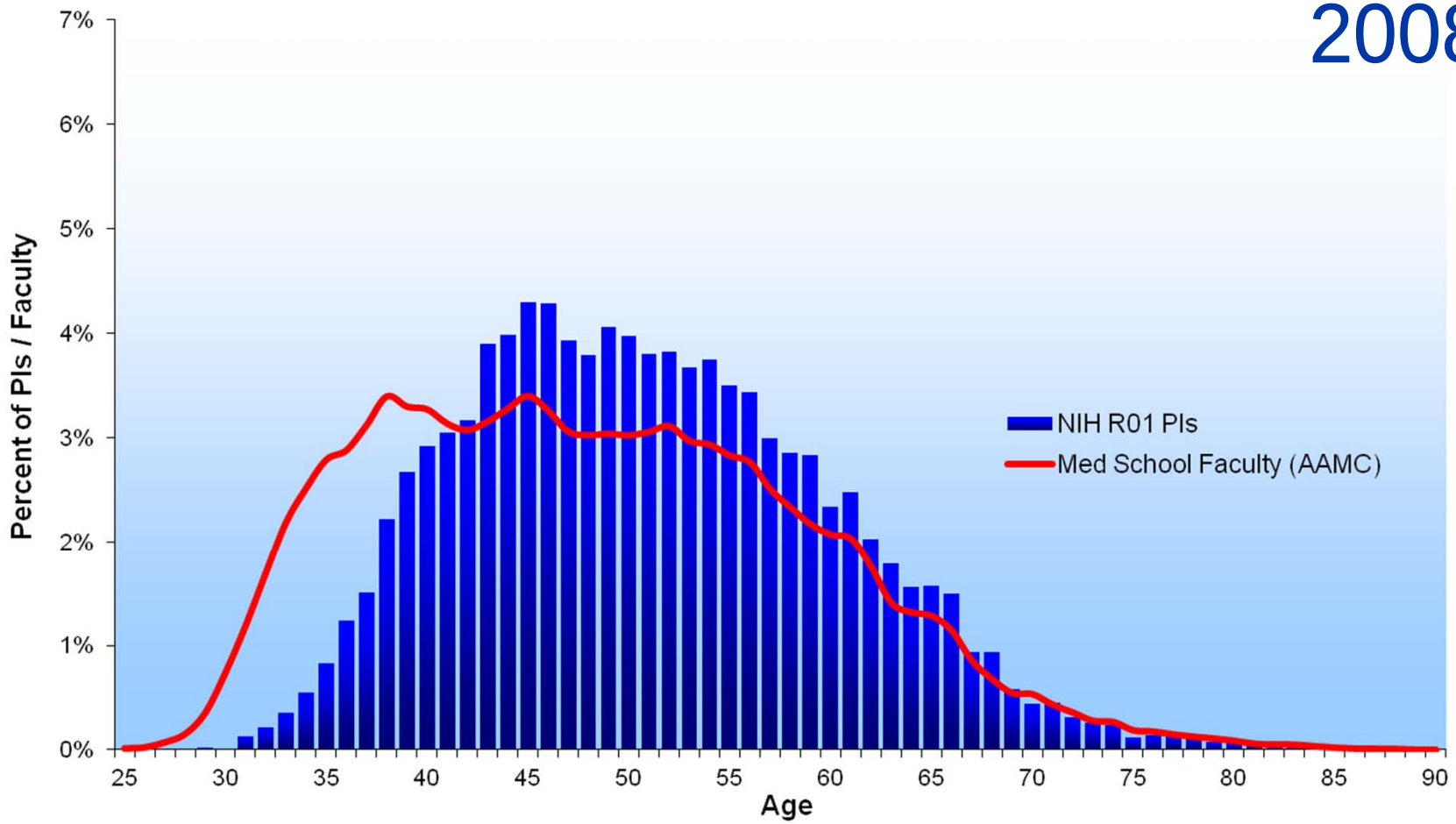
Med School Faculty (AAMC)

2008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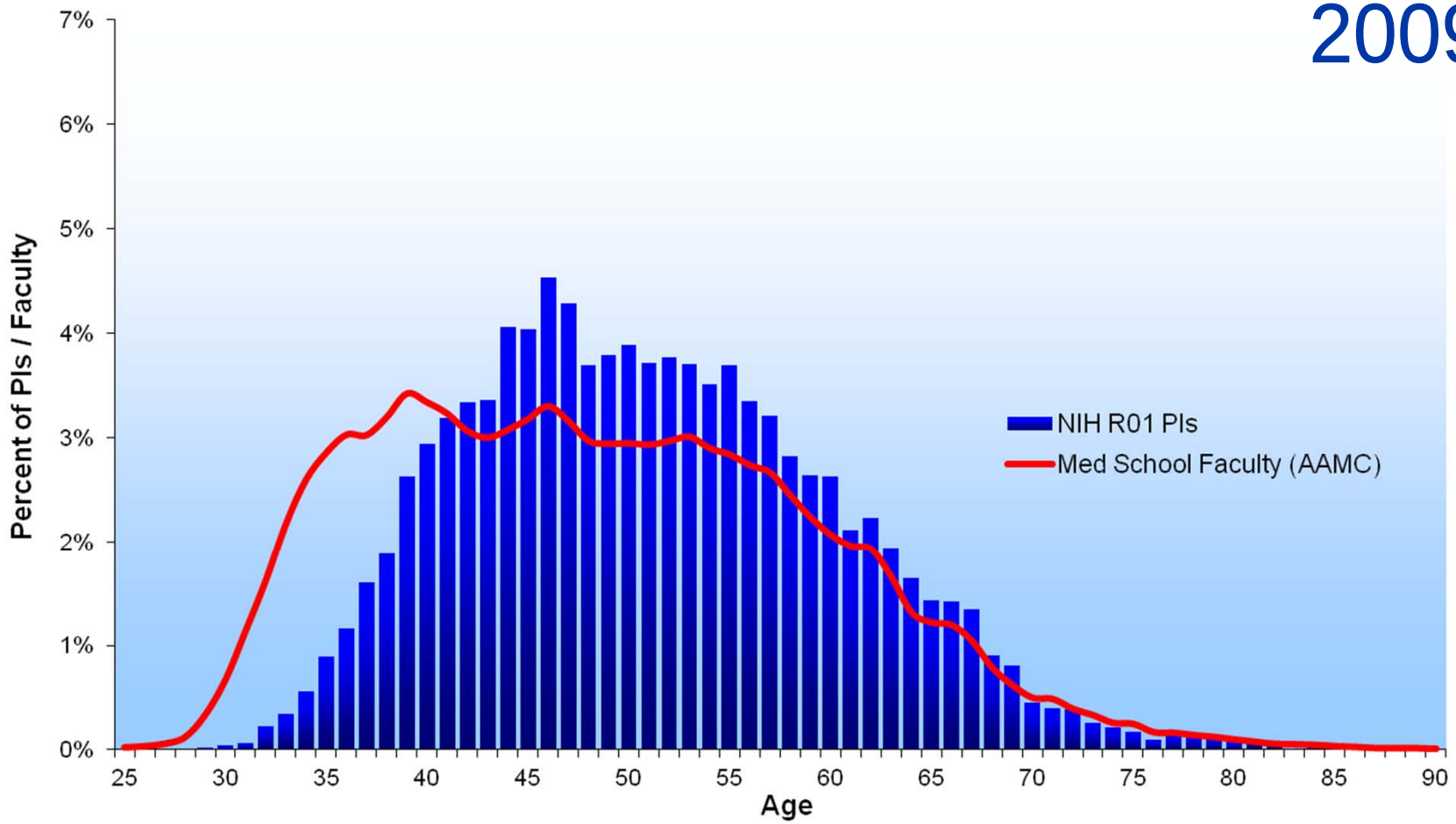
Age
NIH R01 PIs
Med School Faculty (AAMC)

2009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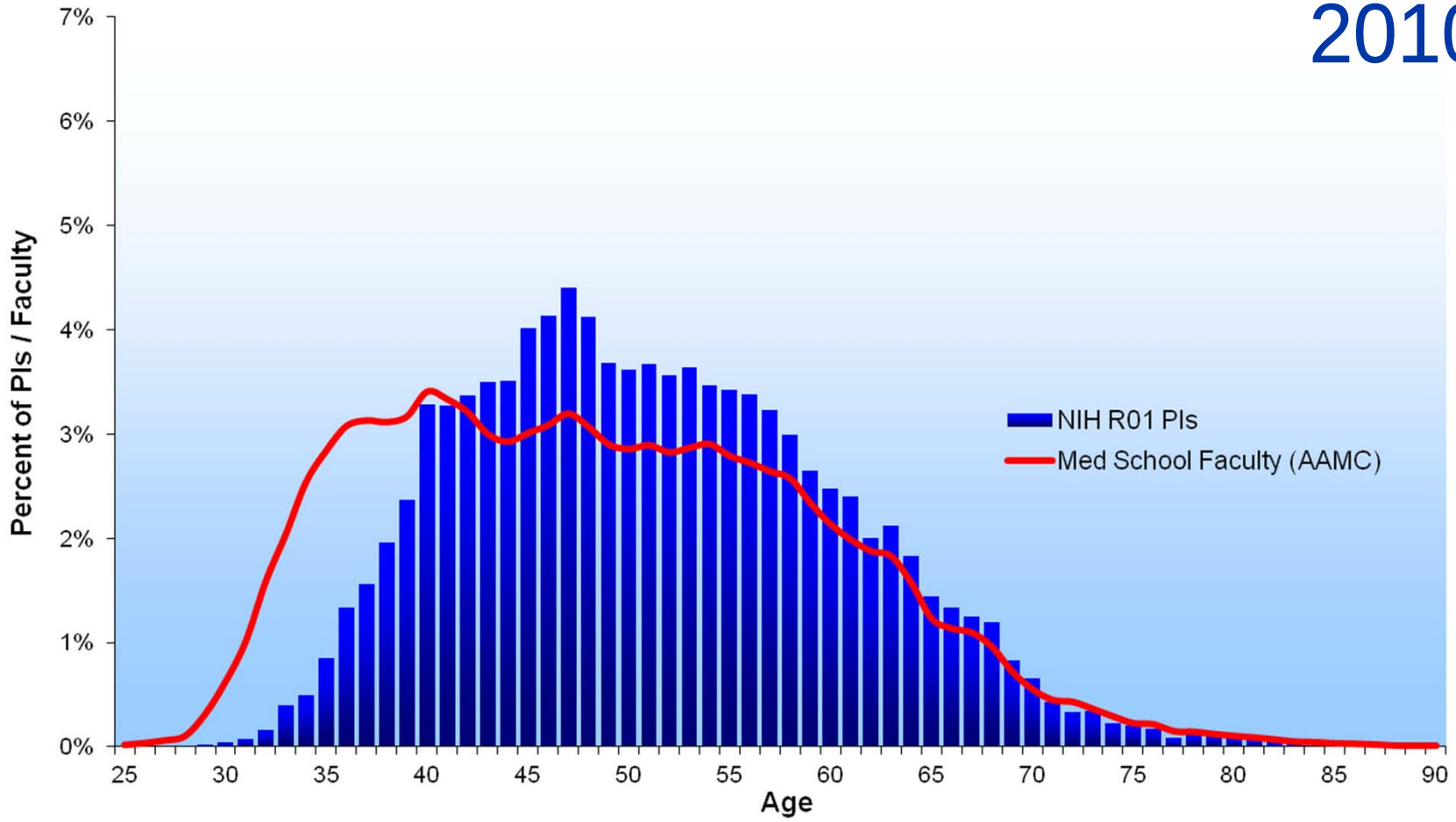
2010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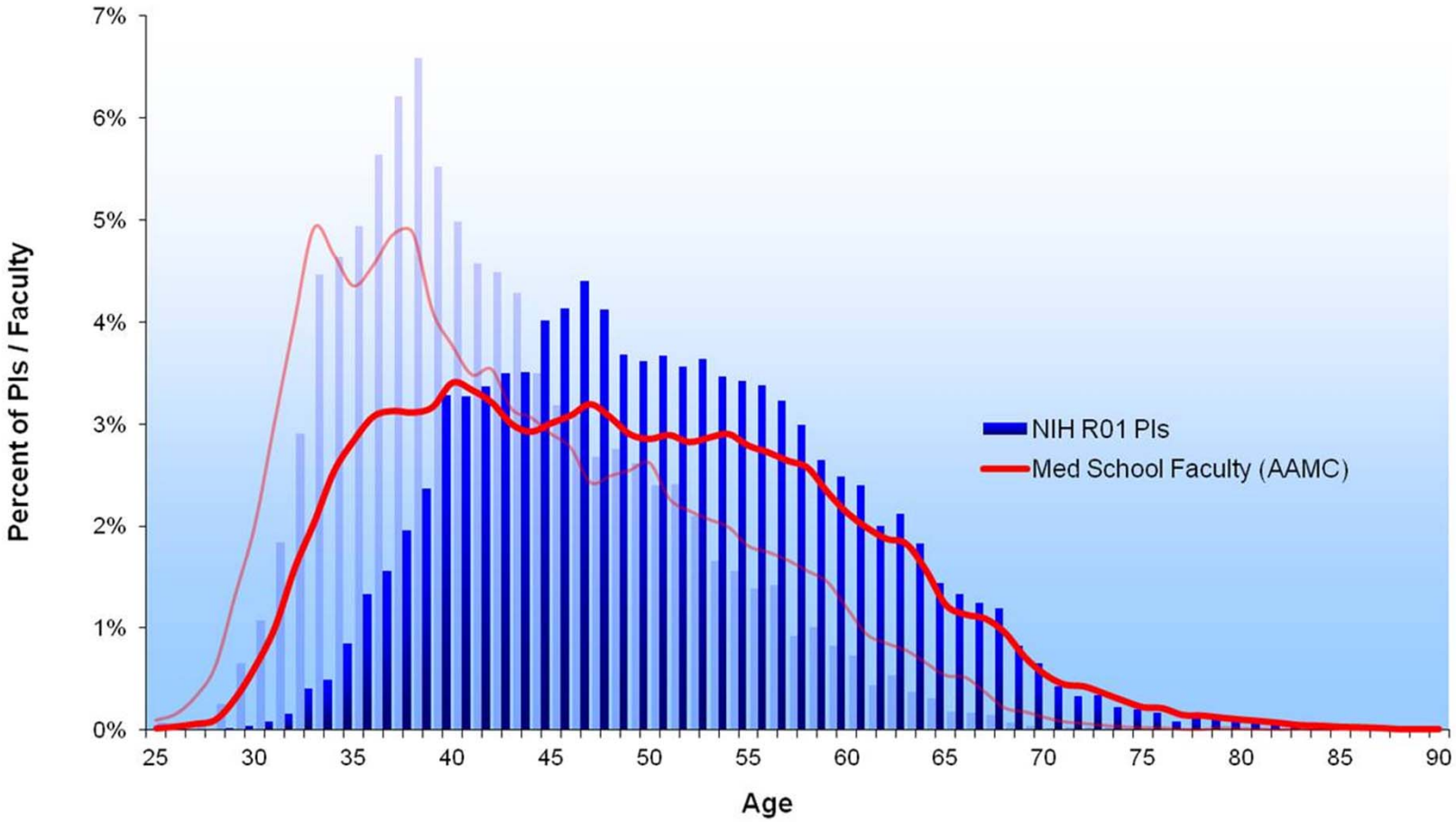
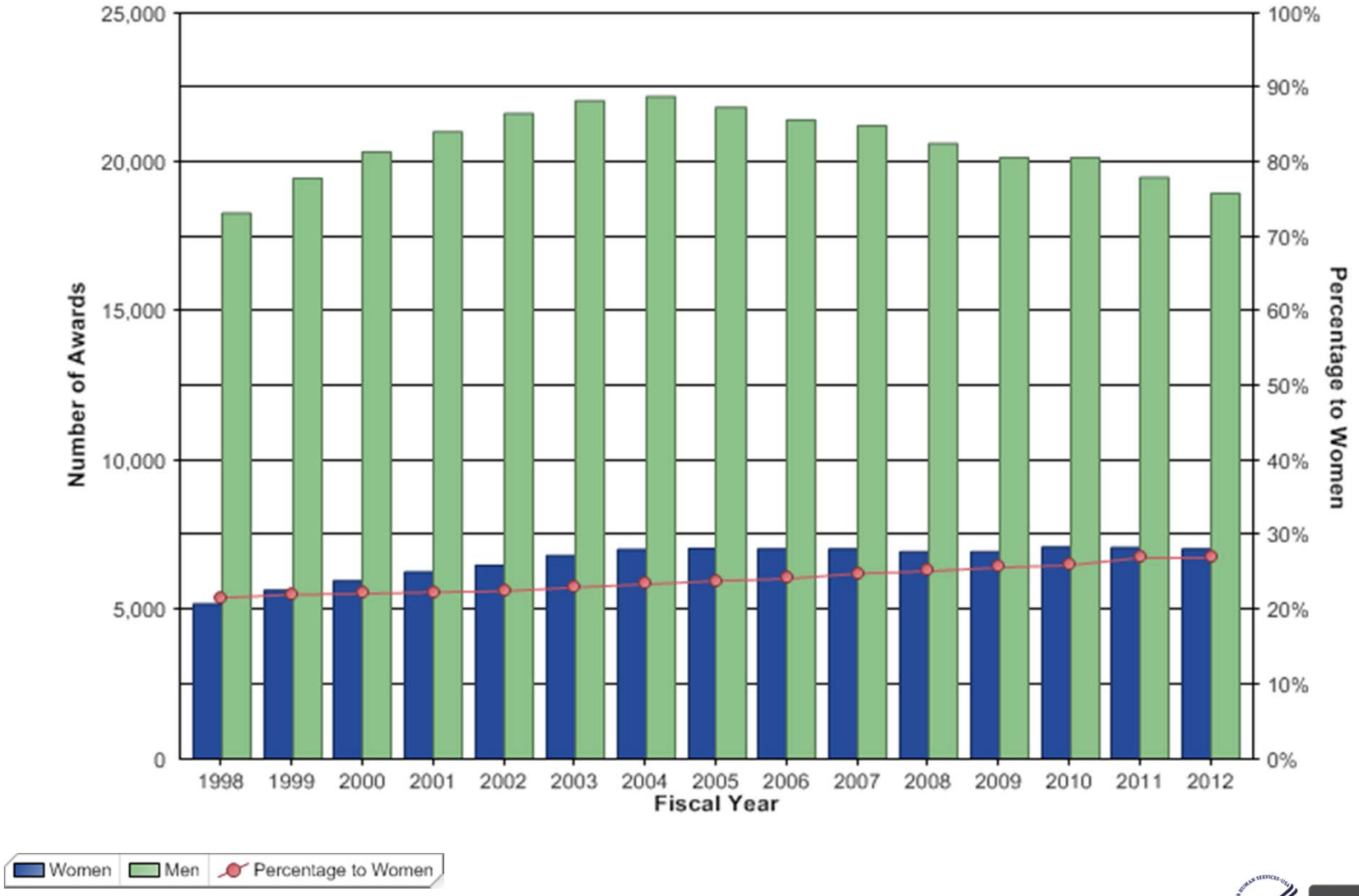
NIH R01 PIs
Med School Faculty (AAMC)

Age Distribution in 1980 and 2010

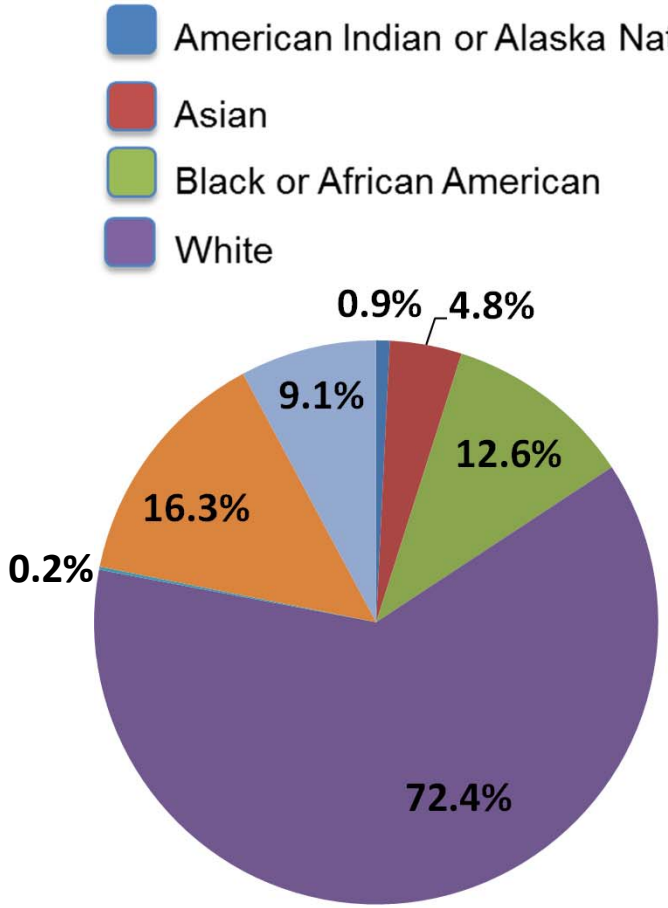


Sources: NIH and AAMC

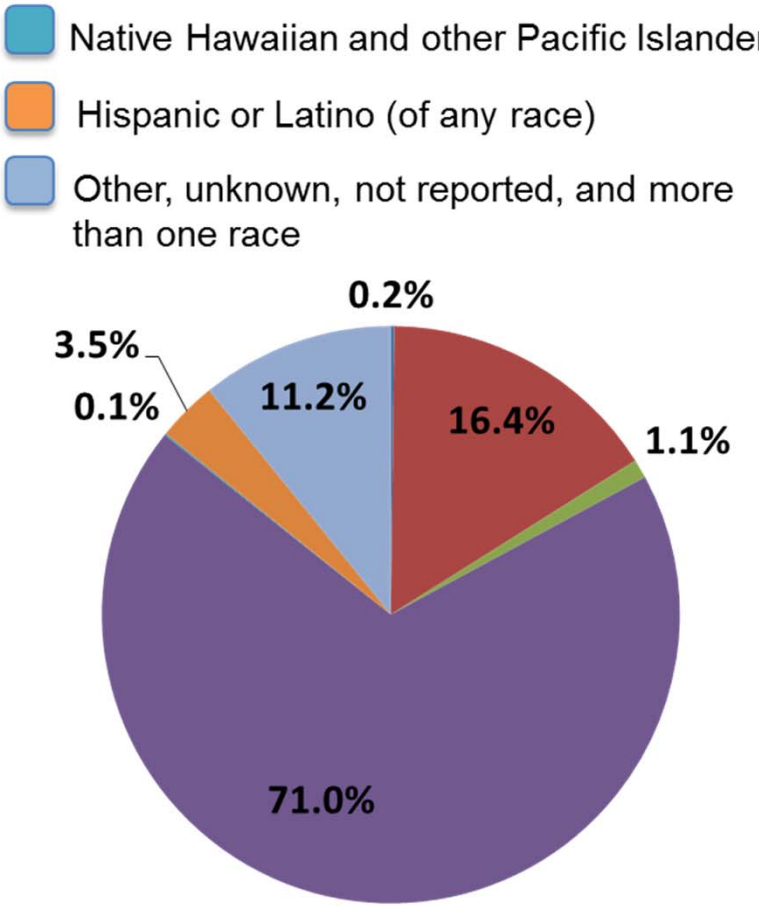
R01-Equivalent grants: Awards by gender



Race and Ethnicity of the 2010 U.S. Population and the 2010 NIH Principal Investigators on RPGs



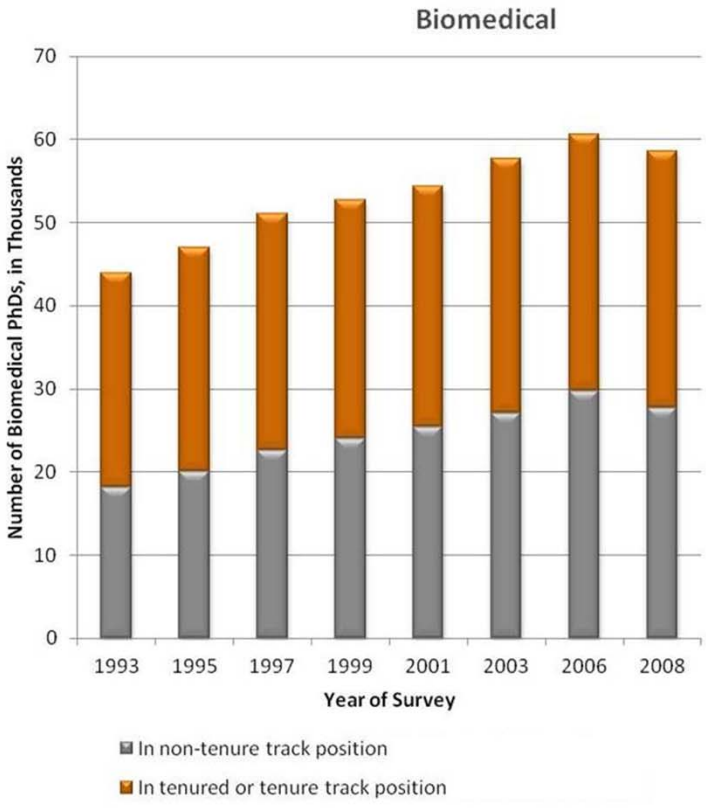
2010 U.S. Census

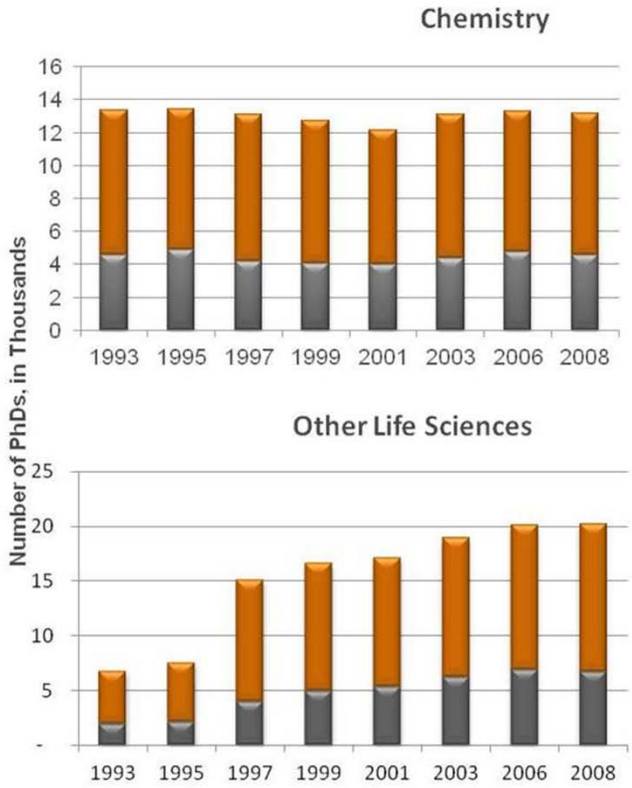


2010 NIH Principal Investigators on RPGs

Sources: US Census Report 2010; IMPACII

U.S. Trained PhDs in academic employment, by tenure track status





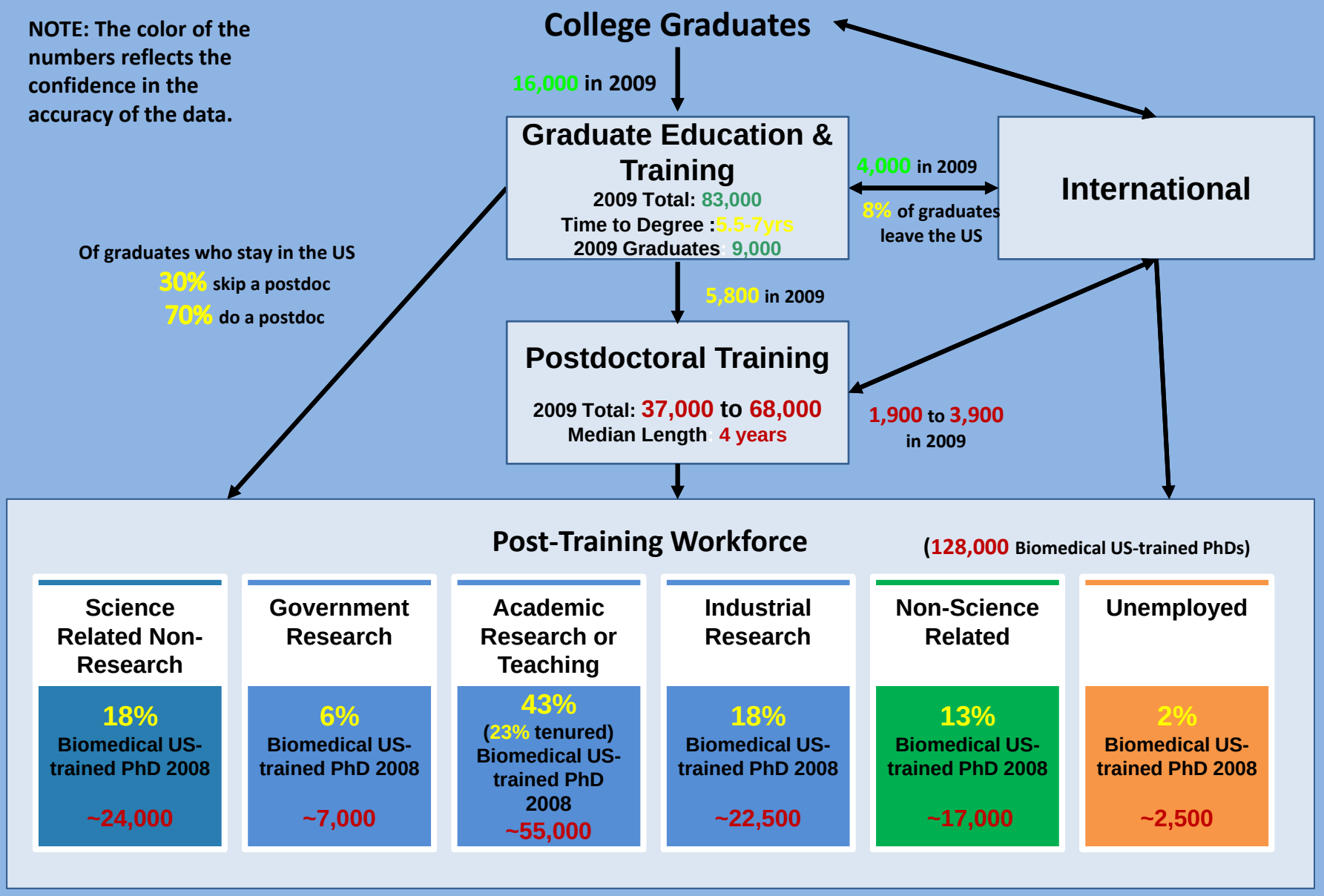
Source: Survey of Doctorate Recipients

Earnings comparison

Years Since PhD	BioMed	Comp/ Math	Physical Science	Social Science	Engineer
0	51,594	66,804	57,775	55,532	72,992
10	87,766	99,972	94,180	87,853	113,314
30	123,959	109,277	122,148	107,321	133,292

Source: Survey of doctorate recipients

Snapshot of the PhD Biomedical Research Workforce



WG Conclusions

Weighing all the data analyzed, the working group concluded that:

- The large upsurge in US-trained PhDs, increased influx of foreign-trained PhDs, and aging of the academic biomedical research workforce make launching a traditional, independent, academic research career increasingly difficult.
- The long training time and relatively low early-career salaries when compared to other scientific disciplines and professional careers may make the biomedical research career less attractive to the best and brightest of our young people.
- The current training programs do little to prepare people for anything besides an academic research career, despite clear evidence that a declining percentage of graduates find such positions in the future.

WG Recommendations

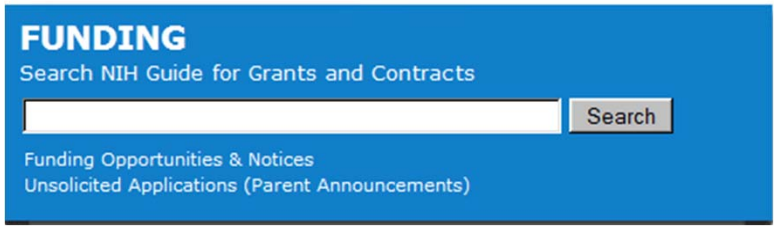
The working group made specific recommendations on:

- **Graduate Students** - diversify and shorten the PhD and increase support on training grants and fellowships.
- **Postdoctoral Researchers** - shorten the pathway to an independent career, increase support on training grants and fellowships, enhance the training aspects of the postdoc, and improve pay and benefits.
- **Information Collection, Analysis and Dissemination** - fill data gaps, routinely tracking of student and postdoc career outcomes, and institute ongoing analysis of the workforce
- **Physician Scientists** - conduct a focused follow-on study.
- **Staff Scientists** - study sections should be receptive to these positions in applications.
- **Salary Support** – long term approach to gradually reduce the percent of funds from NIH.
- **Diversity** – stronger coordination of programs and rigorous evaluation.

NIH Consideration of the Recommendations

- A Pre-Implementation Team developed draft strategies for implementation for every recommendation
- IC Directors engaged in vigorous discussion of the implementation strategies at the NIH Leadership Forum
- Based on the Leadership Forum feedback, an Implementation Team refined the implementation strategies that were presented to NIH Leadership last week
- The exact details and timing of the implementation plans are undergoing review and clearance and may be revised as the plans are developed further

BEST Program - Broadening Experiences in Science Training



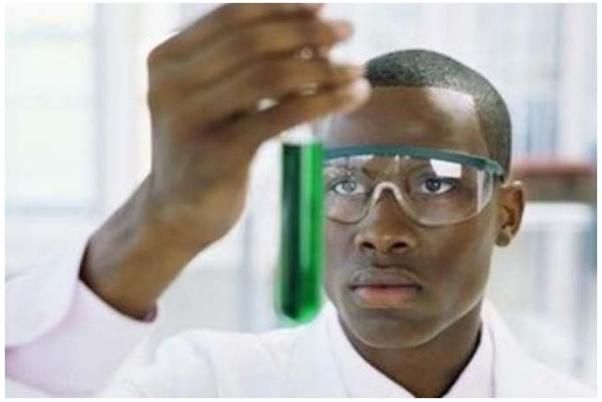
- Common Fund program seeking innovative approaches to complement traditional research training in biomedical sciences at institutions that receive NIH funds.
- Encourage institutions to leverage funds with existing institutional offices and programs, local resources outside the institution, or that partner with industry or other entities.
- Must include rigorous analysis to demonstrate impact.
- Proven approaches will be widely disseminated throughout the biomedical research community; awardees will meet to exchange ideas.

Improve graduate student and postdoctoral training

- Individual Development Plans (IDPs) should be in place for all trainees
  - Grantees that support graduate students for doctoral degrees and/or postdoctoral researchers should have IDPs for these individuals.
  - NIH will not receive the actual IDPs.
- Reduce length of graduate student training
  - Expect institutions to establish anticipated durations of graduate study for doctoral programs.
  - Encourage the expected duration of NIH grant support for doctoral study to be five years (of full-time support). Complex programs may need a longer period.
  - Individual circumstance (e.g., loss of a mentor, extended medical leave, or family leave) could justify a longer period of doctoral study and support.
- Provide F30 and F31 fellowship awards from all Institutes and Centers

Postdoctoral stipend and benefits

- Increase initial postdoctoral researcher stipend
- Benefits:
  - Solicit input from the community on benefits currently provided to postdocs
  - Pending input from RFI, consider policy that would equalize benefits across various NIH support options and improve consistency with packages available to other employees.
  - If possible, NIH will describe benefits currently offered as a way to develop a national "standard" or "minimum" recommended package.



Increase awards that encourage independence

- K99/R00
  - Aim for 30% success rate, assuming sufficient funds and meritorious applications as well as consistency with funding priorities.
  - Phased increase over three years.
- Early Independence Awards
  - Planned increase from 10-15.
  - Exact number of awards will depend on availability of funds and quality of applications and consistency with funding priorities.

Develop a simple and comprehensive tracking system for trainees

- Identify all students and postdocs supported by the NIH and use information to pre-populate forms (e.g. Research Performance Progress Report - RPPR and biosketch).
- Develop SciENcv as a way to assist with the pre-population of federal biosketches.
- Explore the use of unique, persistent researcher IDs (such as ORCID) to reduce name ambiguity and simplify tracking
- Automate currently required NRSA training tables so that they track all students and postdocs in related positions for 15 years after training
- Encourage institutions to report aggregate career outcomes of graduate students and postdocs publicly

Changes to review

- Study sections for training grants should consider a range of career outcomes, including research-related careers
- Review committees should consider all graduate students in relevant programs.
- Encourage fair consideration of Staff Scientists on grant proposals.
  - In evaluating the Investigator(s) review criterion, reviewers are encouraged to focus on the qualifications and expertise of the research team assembled for the work proposed, regardless of whether members of the research team are tenured, non-tenured, trainee or support staff.

Assess NIH support of faculty salary

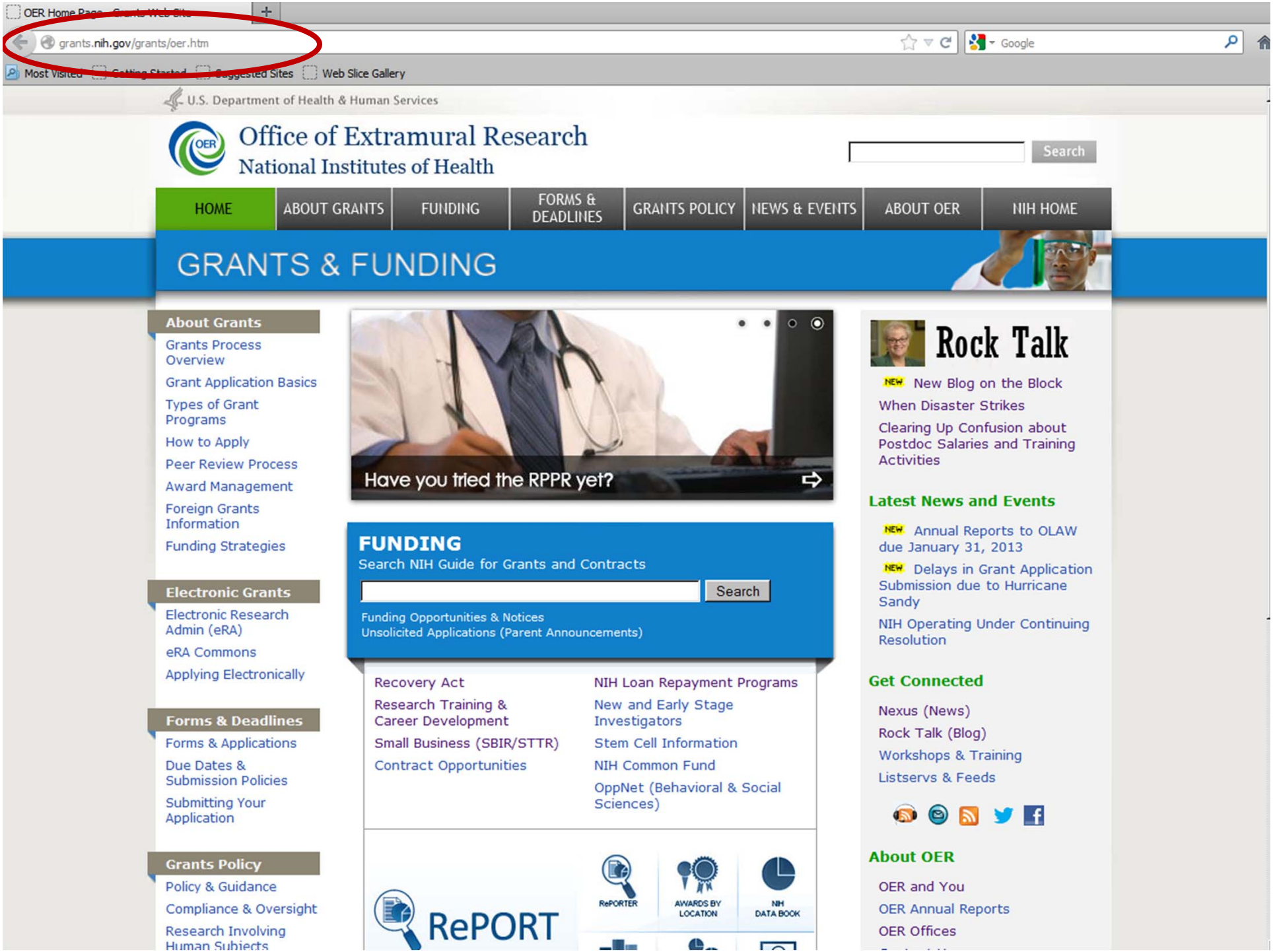
- Launch a multi-faceted conversation with the extramural community.
- Establish a trans-NIH committee to consider the scope of the various salary support options and determine what type of data need to be gathered to inform the deliberations.
- Initiate a discussion with other Federal agencies that support salaries through research grants.

Create functional unit at NIH to assess biomedical research workforce

- Coordinate activities across NIH to provide a unified source of information/data on workforce issues.
- Responsibilities include:
  - Continue and update current workforce analyses
  - Create a credible model of workforce dynamics and provide periodic updates
  - Point of contact for NSF, AAMC, BLS, and extramural researchers studying the workforce
  - Coordinate automation and streamlining of internal NIH data collections
  - Develop the annual BRDPI metric

Conduct ACD Working Group study on optimal research training of individuals in clinical disciplines

- Co-Chairs from NIH and ACD, roster to be determined
- Proposed Charge:
  - Develop approaches that can inform decisions about the development of U.S. clinician-scientist biomedical workforce
  - Analyze the current composition and size of the clinician-scientist biomedical workforce
  - Assess present and future needs and career opportunities available to support clinician-scientist trainees
  - Identify the incentives and barriers to clinicians entering and continuing to engage in scientific activities
  - Recommend actions that NIH should take to support a sustainable and diverse clinical research infrastructure, as well as recommendations for actions needed by other relevant stakeholders.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Stem Cell Information
NIH Common Fund
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Dr. Sally Rockey is NIH's Deputy Director for Extramural Research, serving as the principal scientific leader and advisor to the NIH Director on the NIH extramural research program.

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