Demographics of women in biomedical research*: What is the current reality?

Women in Biomedical Research:
Best Practices for Sustaining Career Success
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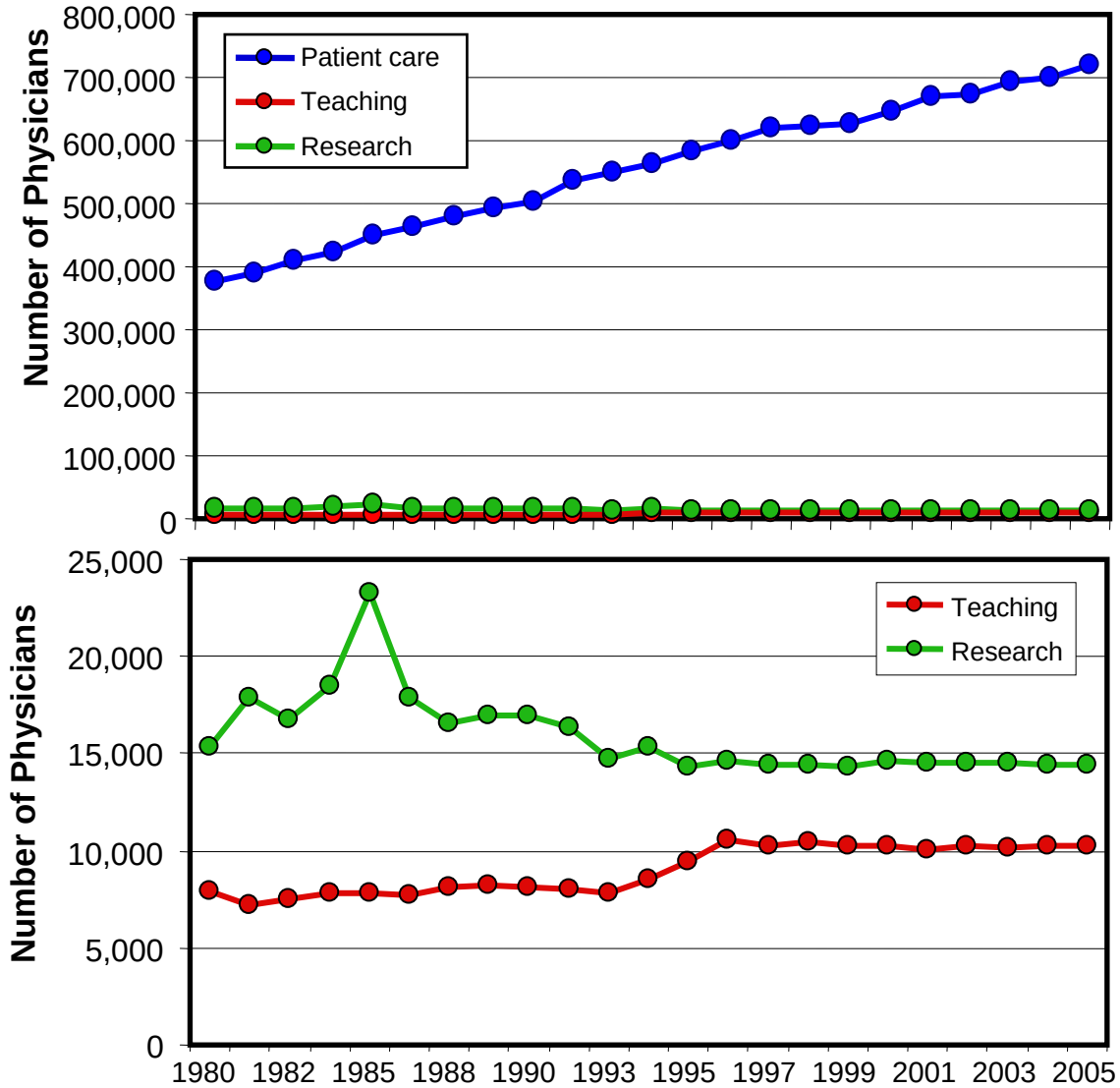
* With emphasis on physician-scientists

The overall message:

The physician-scientist career path is at steady-state.

(wild cards: age and gender)

Number of physicians has doubled in the past 25 years



Number of physician-scientists has not changed.

~1000 new physician-scientists per year required to achieve steady-state

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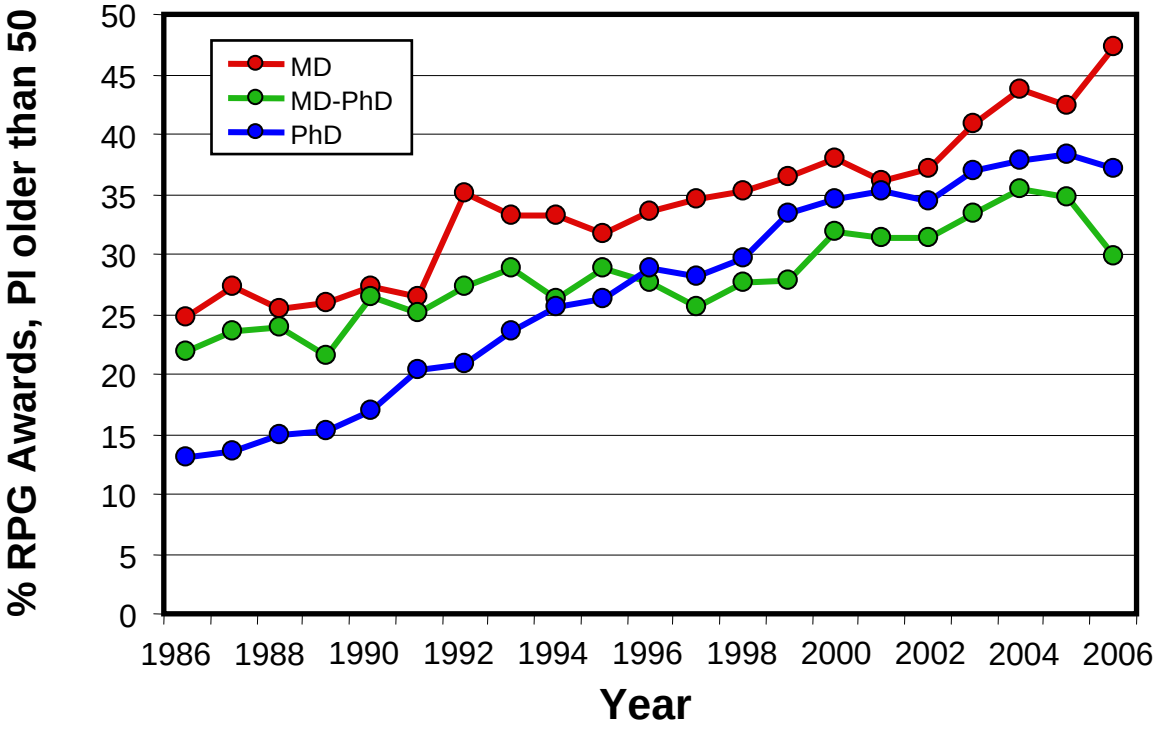
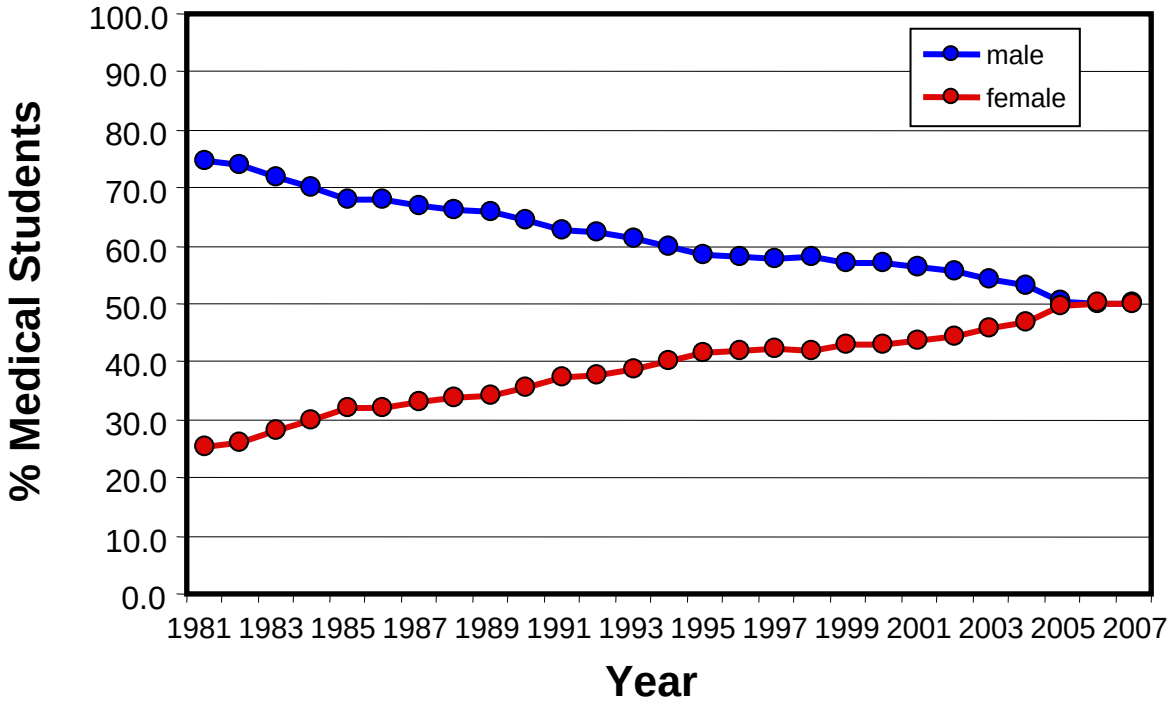
So, what’s the concern?

Sustained trends in the demographics may soon perturb the steady-state

NIH funded scientists are getting older



And the gender of medical students has shifted to equality



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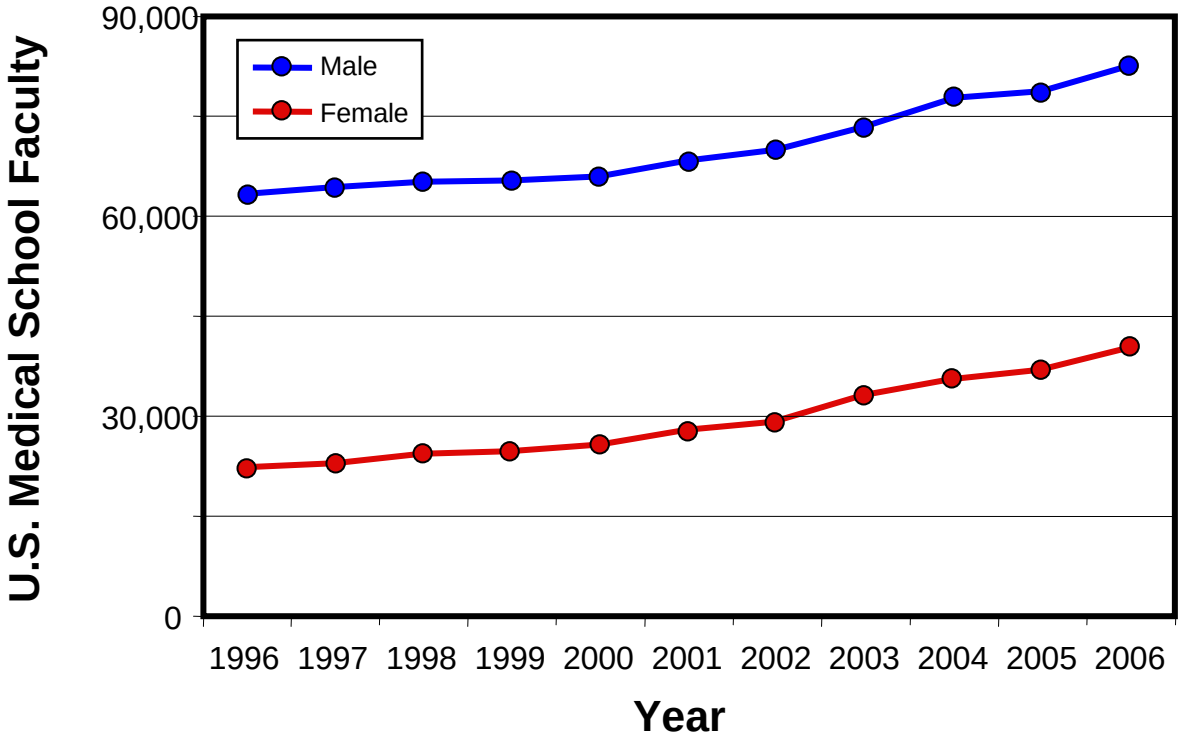
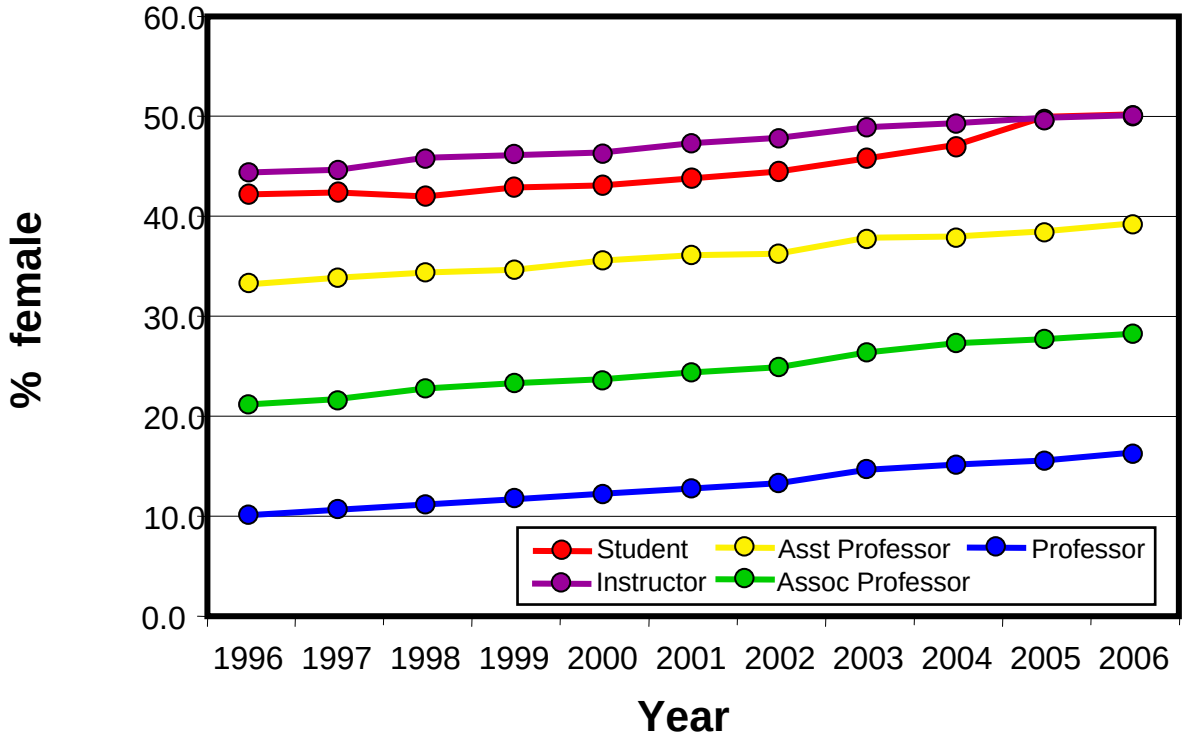
With no change in the proportion of female medical school faculty



AAMC Faculty Survey

And very slow increases in the proportion of women at all career stages, linked to growth at entry



2006
Women: Men

6,130: 6,235

17,725: 28,922

6,824: 17,945

4,226: 23,419

10-15% attrition occurs at every stage of the academic ladder

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Projected year of equality (assume no change in trends):

- Instructor: 2005
- Assistant Professor: 2023
- Associate Professor: 2038
- Full Professor: 2058

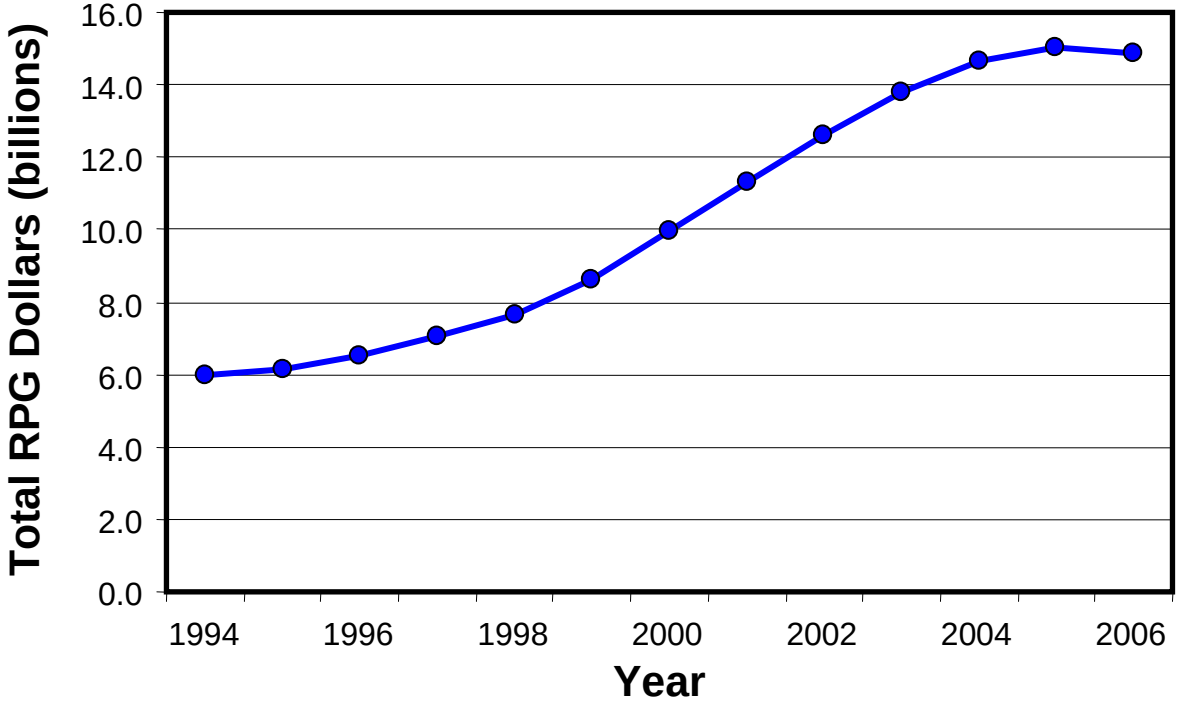
Key demographic issues:

- Total physician-scientist numbers are currently at steady-state, BUT
- NIH funded biomedical scientists are getting older
- More women entering medicine
- Disproportionate career attrition for women

The career path from 30,000 feet:

The database of NIH Research Project Grant awardees by age, gender, and degree type

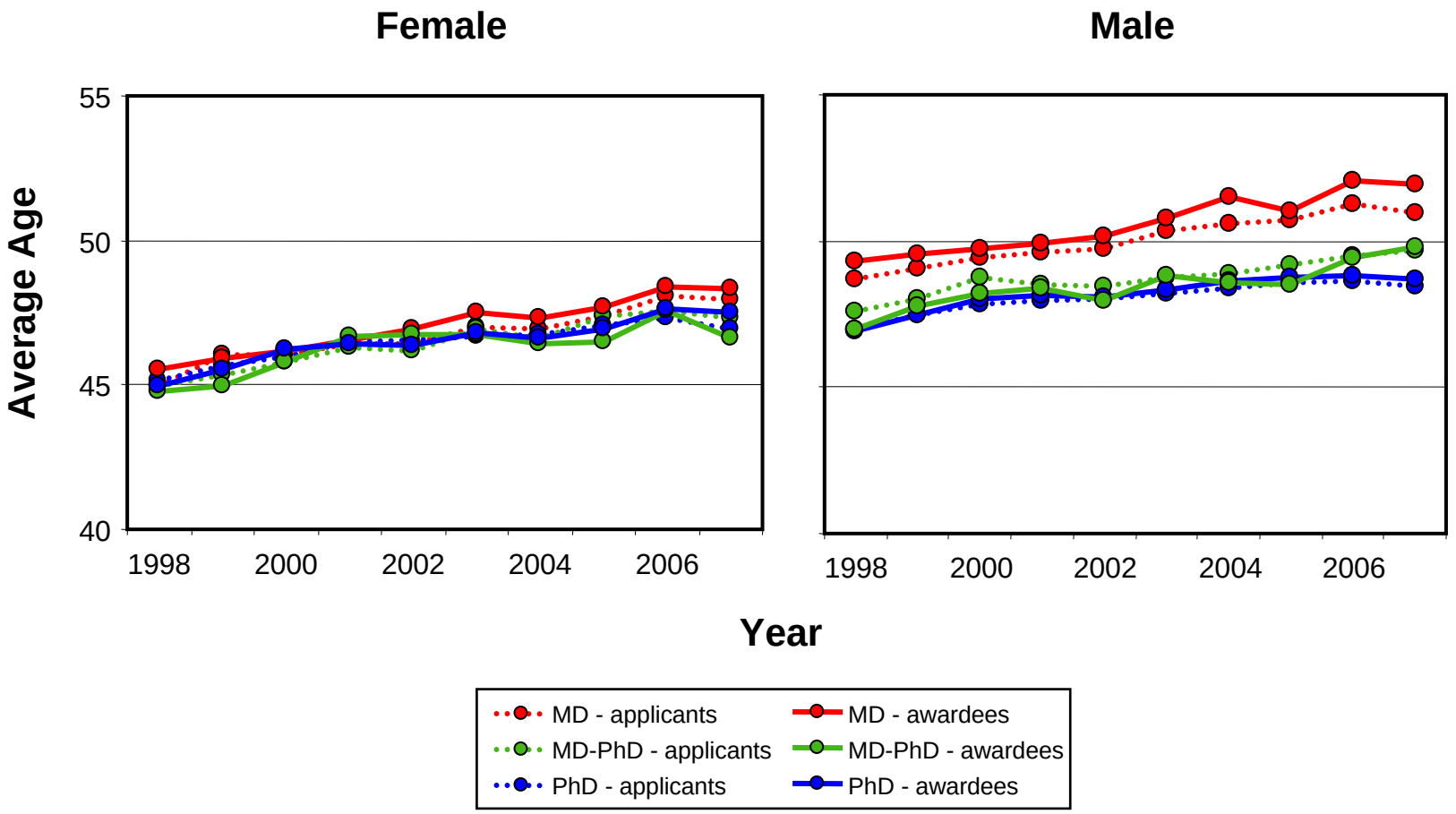
Funding of Research Progress Grants over the past 15 years

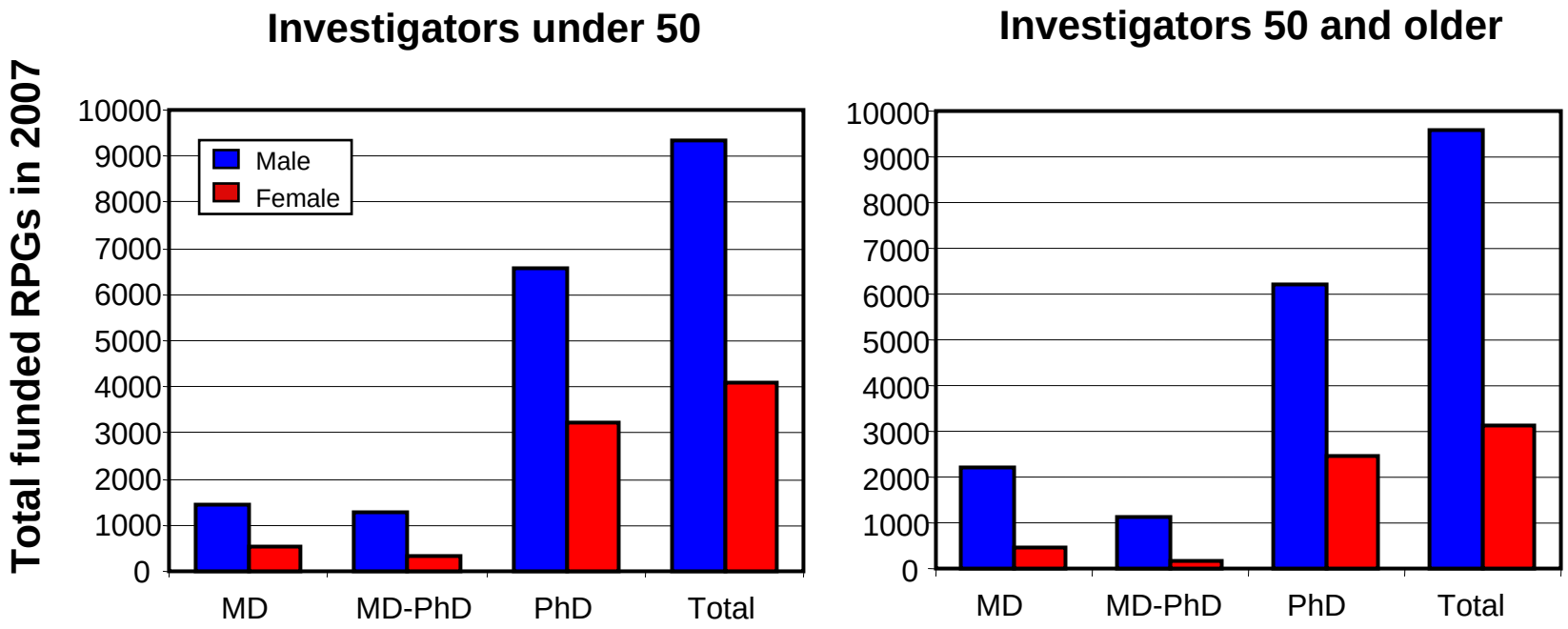


RPG=Research Project Grants (2/3 of NIH budget)
R00, 01, 03, 15, 21, 22, 23, 29, 33, 34, 35, 36, 37, 55, 56
P01, P42, PN1
UC1, UC7, U01, U19
DP1, DP2

NIH

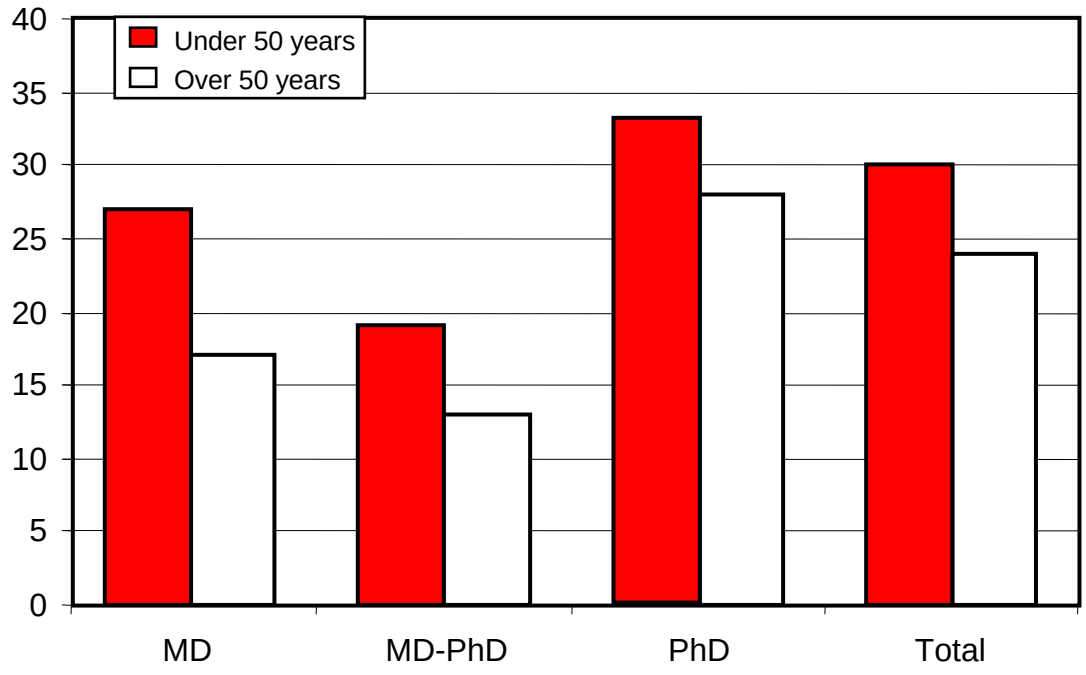
All RPG applicants and grant holders are getting older: Females are 3-4 years younger than males



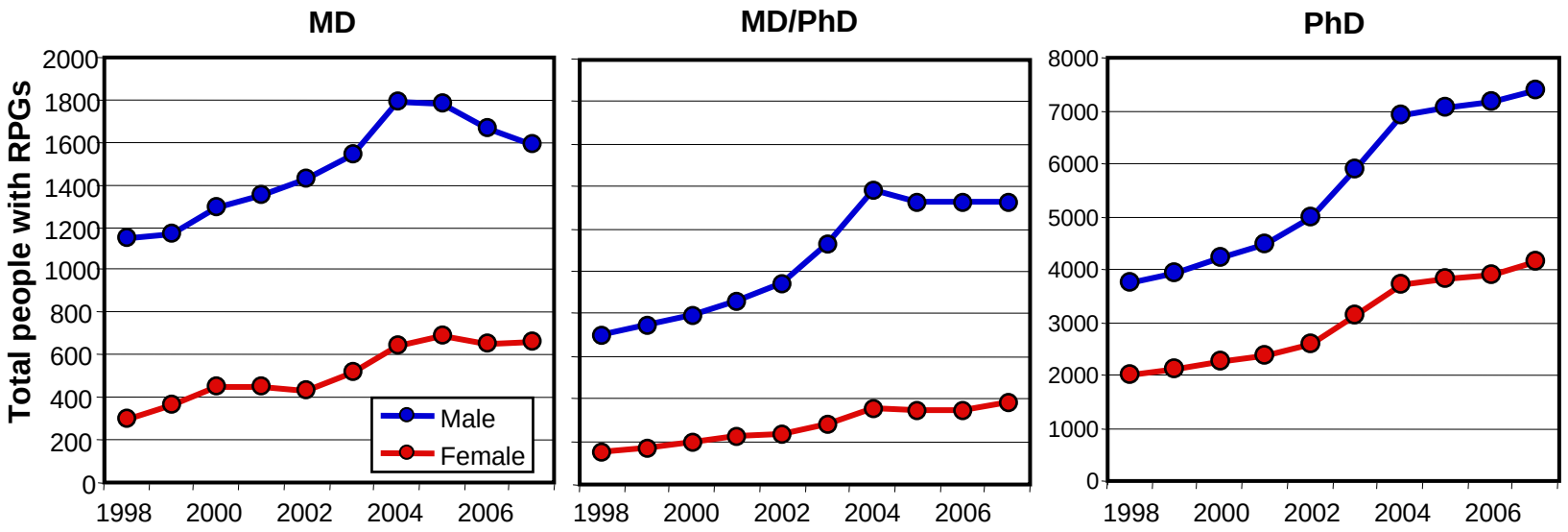


Progressively fewer female RPG grant holders with age:
lowest numbers for physician-scientists

% Decline of female RPG grant holders with age: biggest for MDs (2007 data)



These are longstanding trends, and are not changing



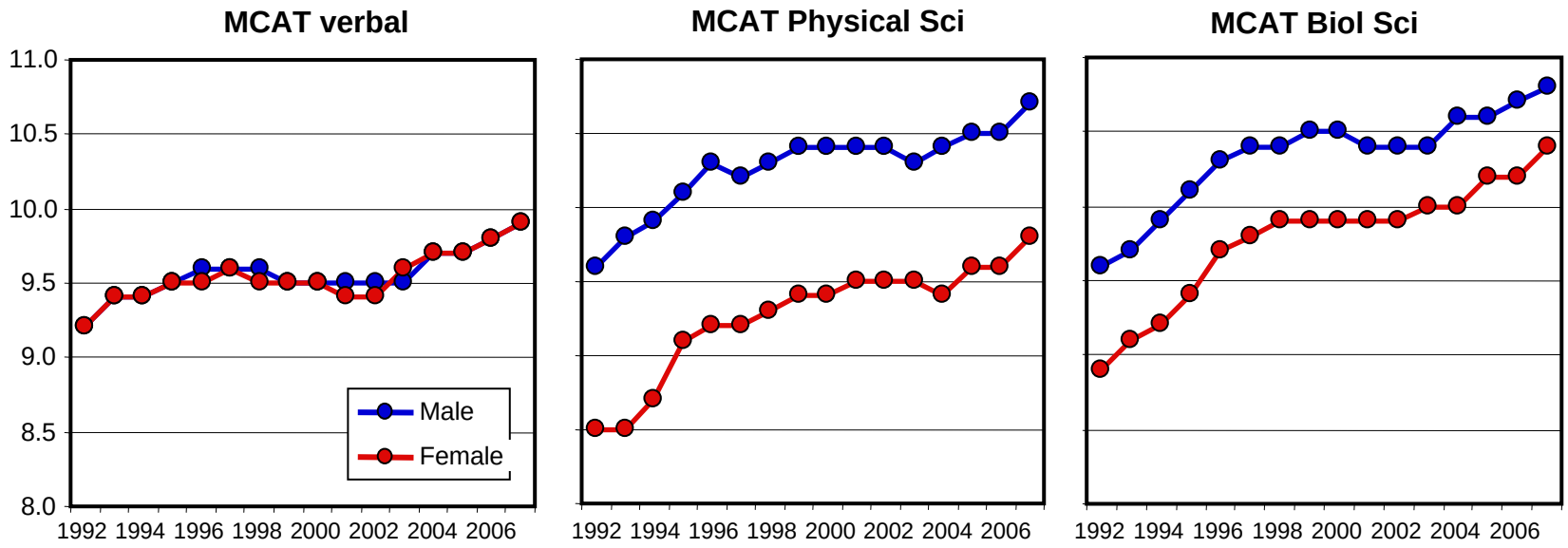
When are women leaving the career path?

An assessment from “cradle to grave”

Are young women entering medicine equally prepared for science careers?

- Do matriculating female medical school students have equal MCATs and GPAs?
- Is there growth in female matriculants to MD-PhD programs?
- Does there continue to be interest in research careers among medical school students?

Female medical school matriculants score slightly lower* on the MCAT in physical and biological sciences



* Note scale

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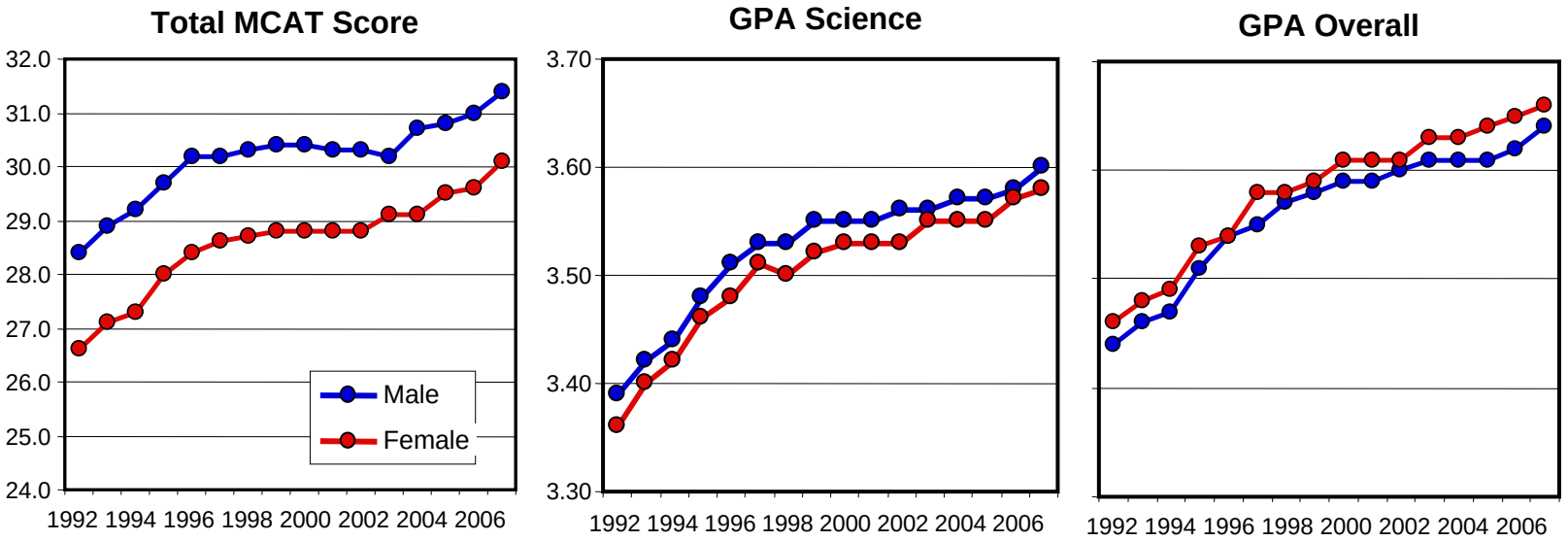
Matriculating female medical students have slightly lower MCATs, but identical GPAs



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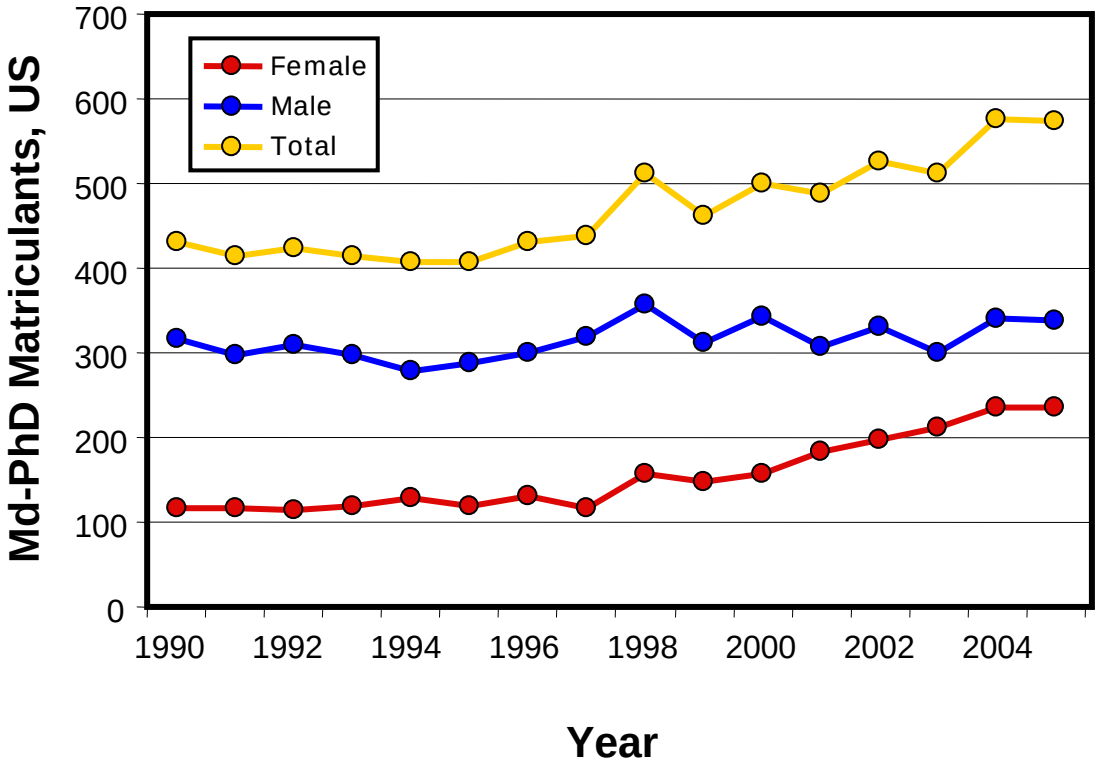
Recent growth in MD-PhD programs is all from females



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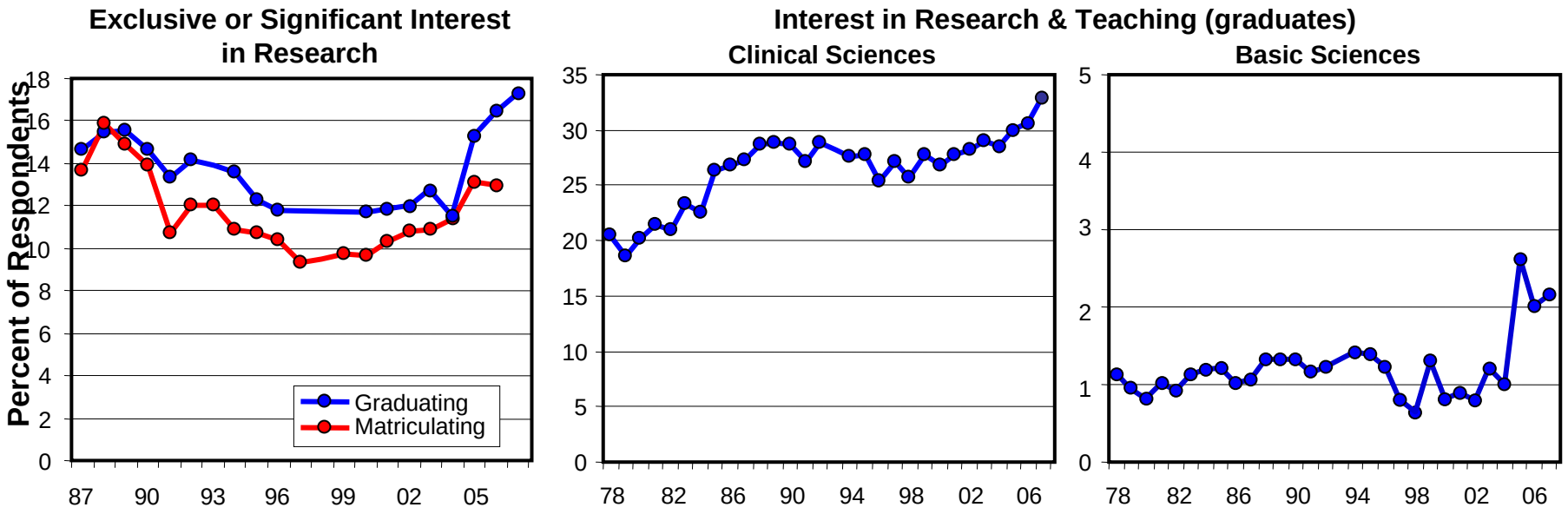
Graduating medical students have displayed increased interest in research careers since 2005

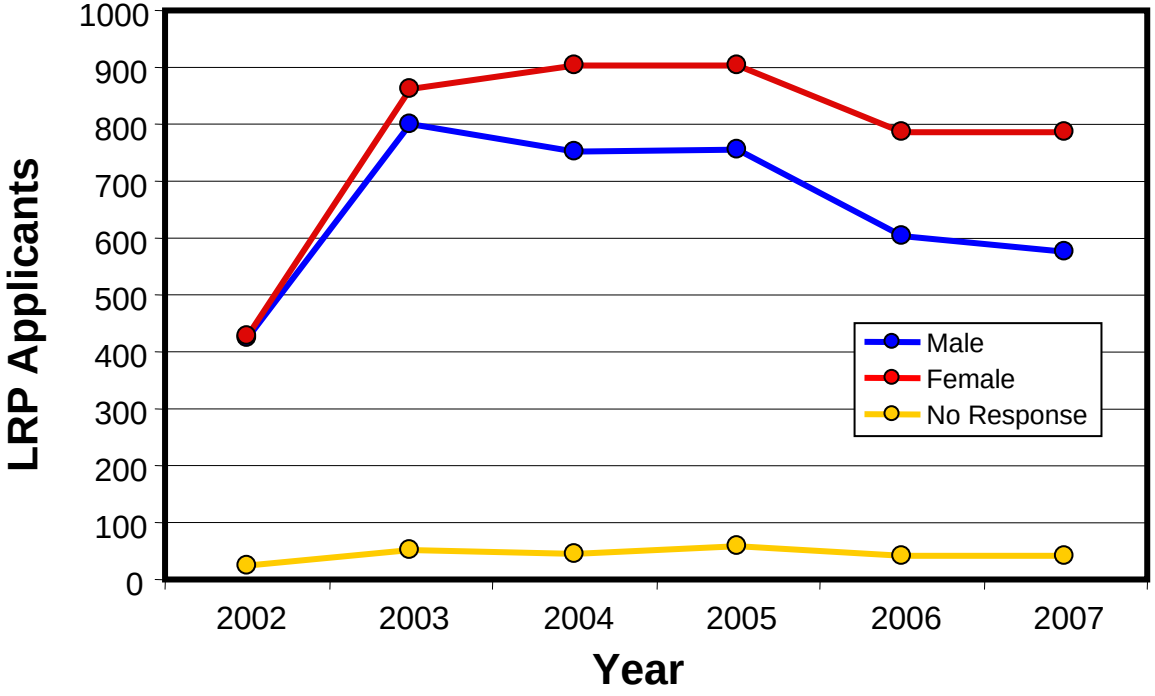


AAMC MSQ and GSQ

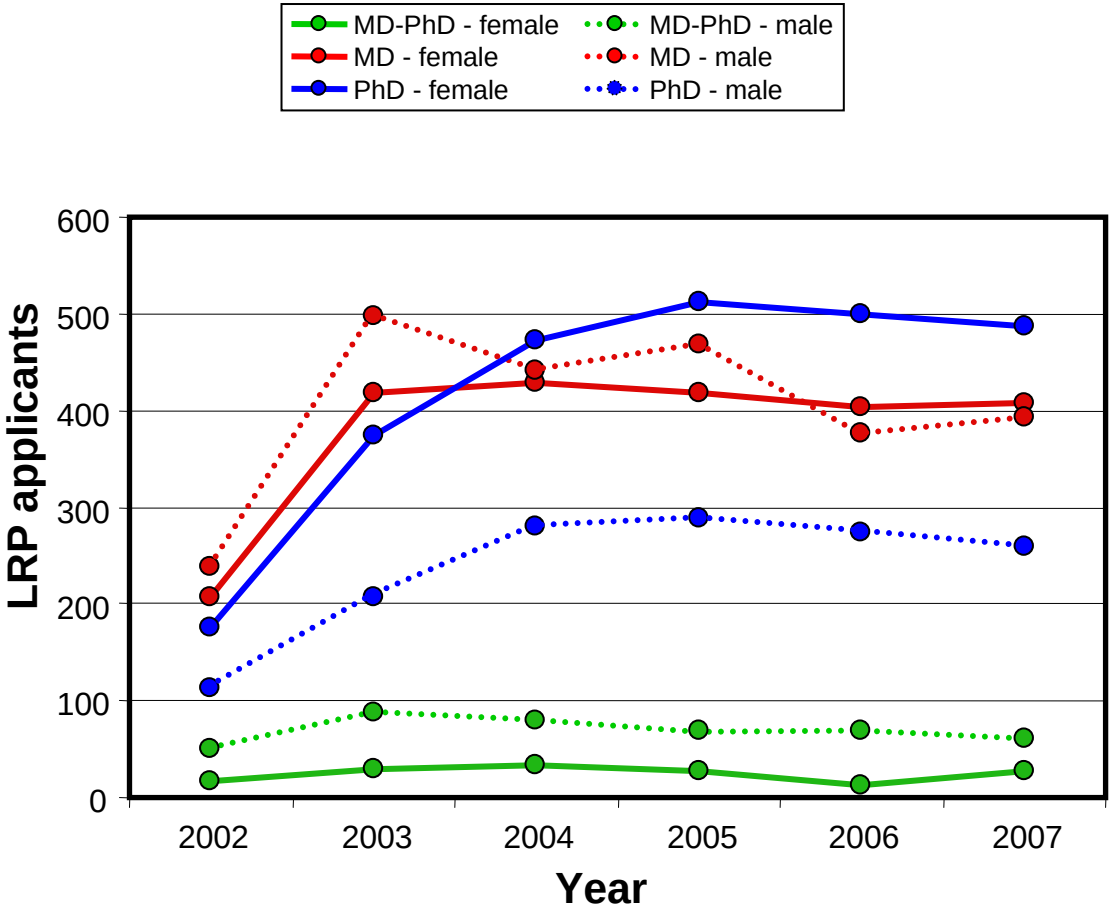
When does career attrition begin?

- Do grant applications and success rates change as careers progress?
  - Early Fellowship? (LRPs)
  - Late Fellowship? (K23 for patient-oriented research, K08 for basic and translational reseach)
  - **First time** R01/RPG applicants?
  - **Previously funded** R01/RPG applicants?

The majority of first-time LRP applicants are female



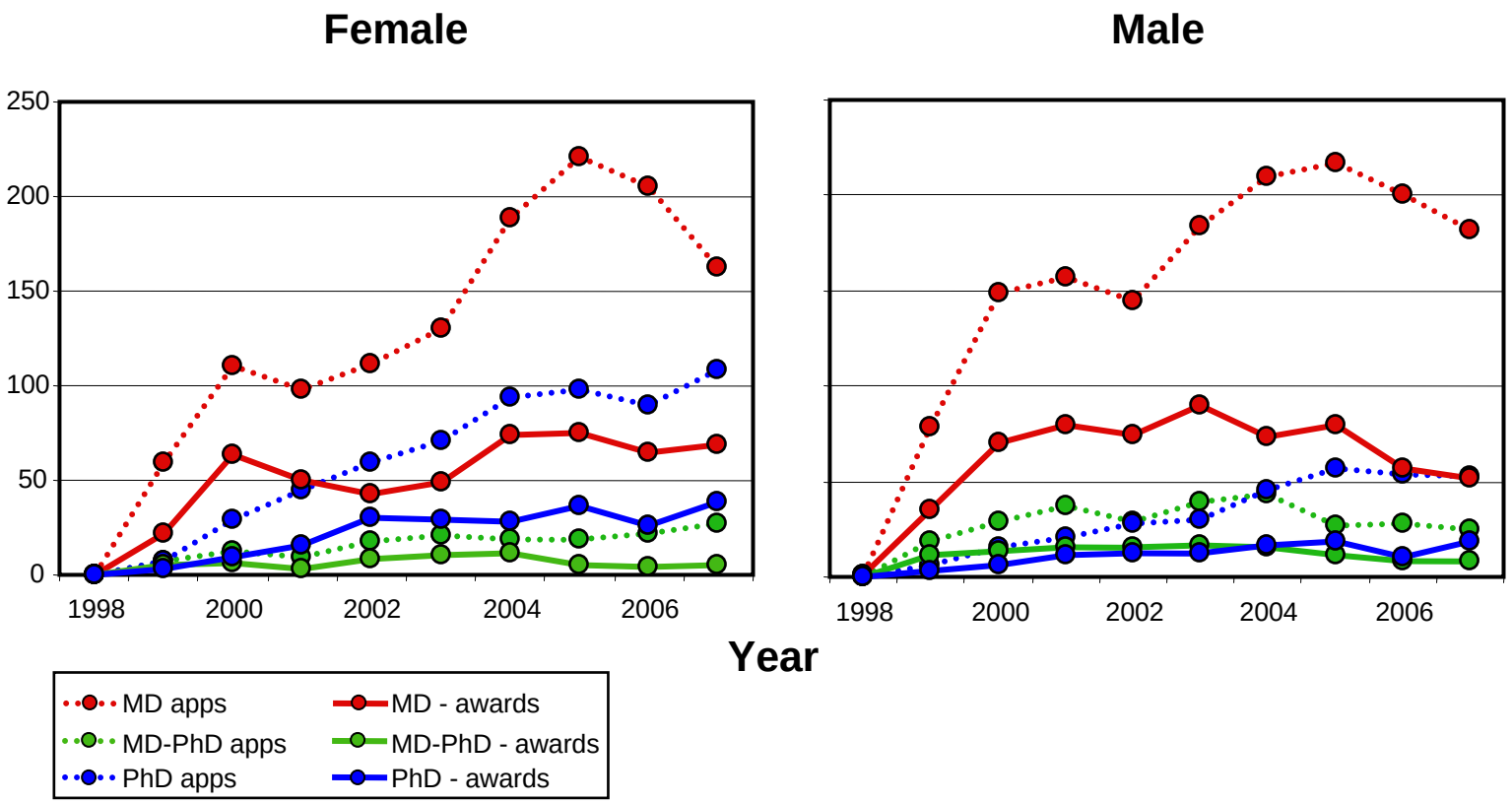
Success rates are identical:
in 2007, 44% for males, 43% for females



Equal numbers of female & male MD applicants:
2:1 female PhD applicants

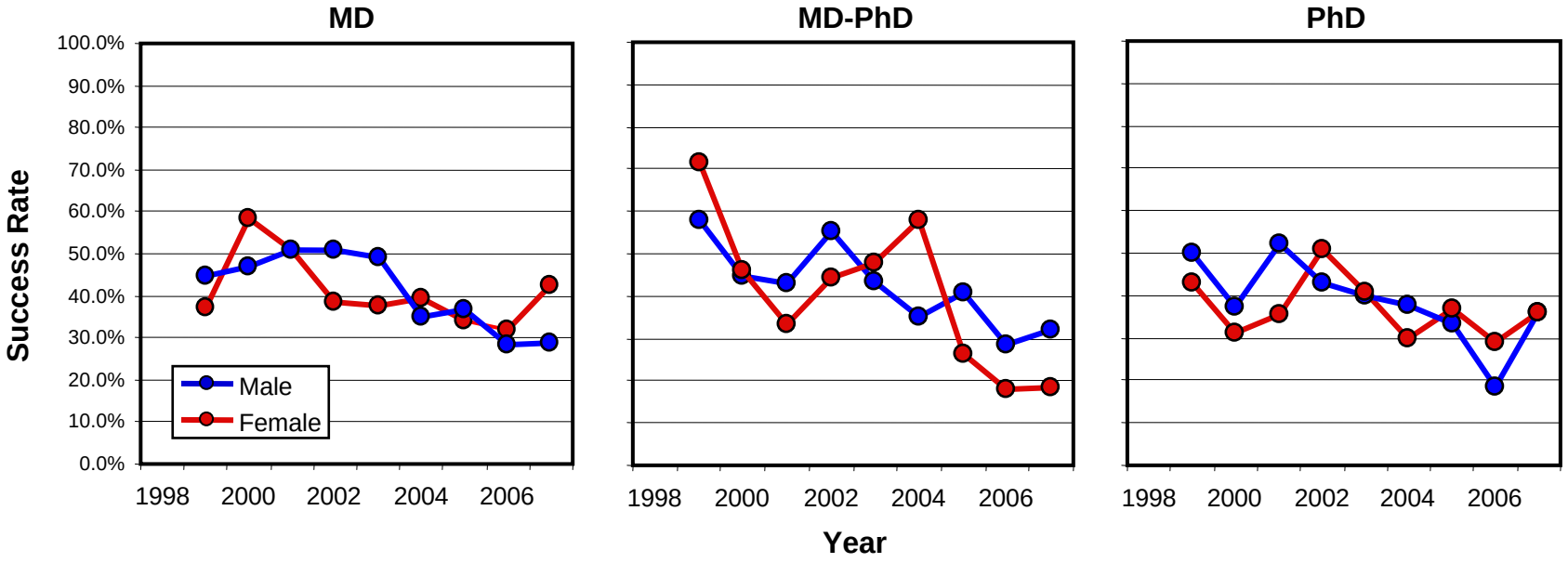
LRP

Gender equality for K23 applicants* and awardees

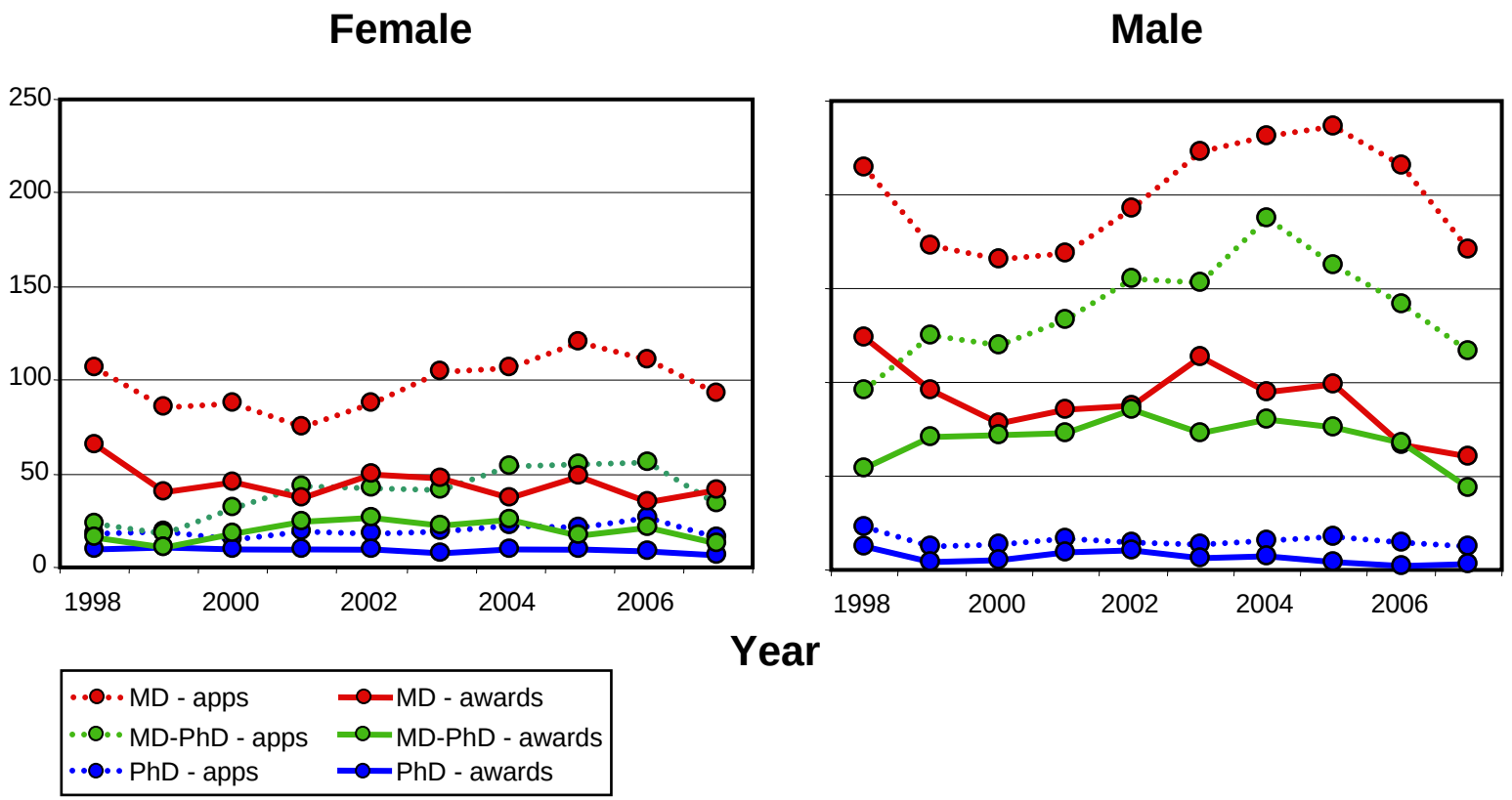


* Decline since 2005 is of concern

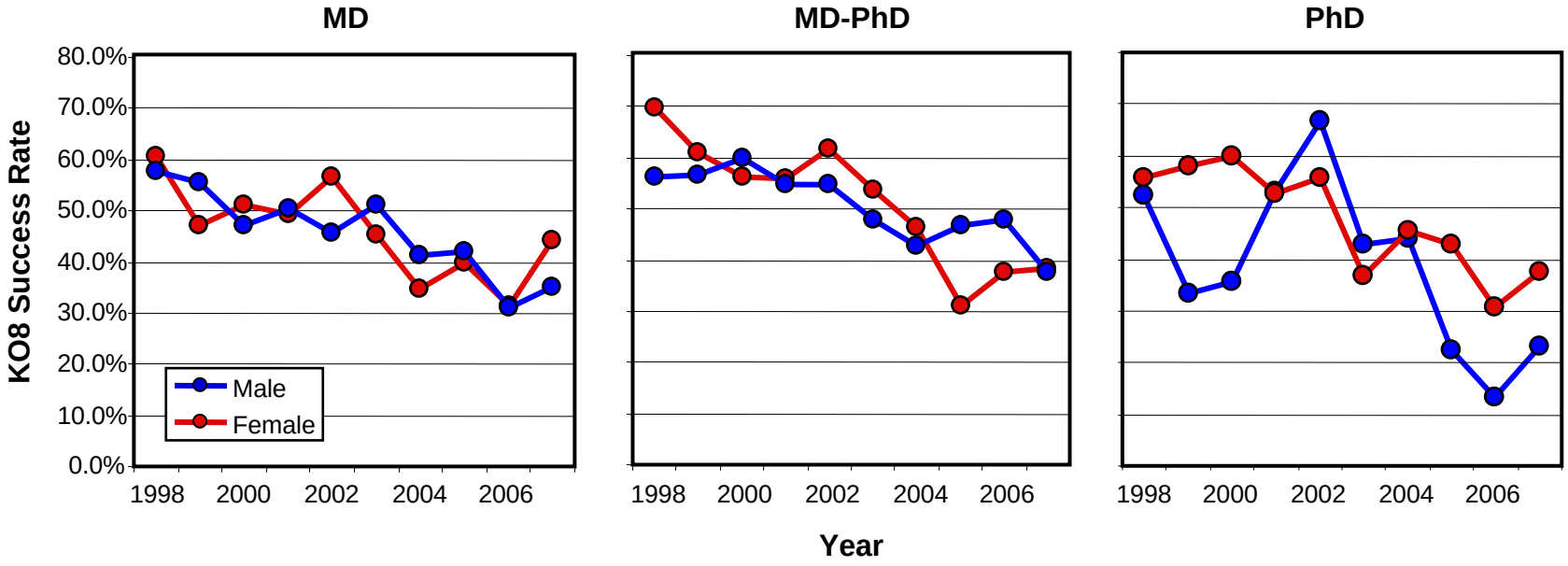
Equal K23 success rates for both genders and all degrees



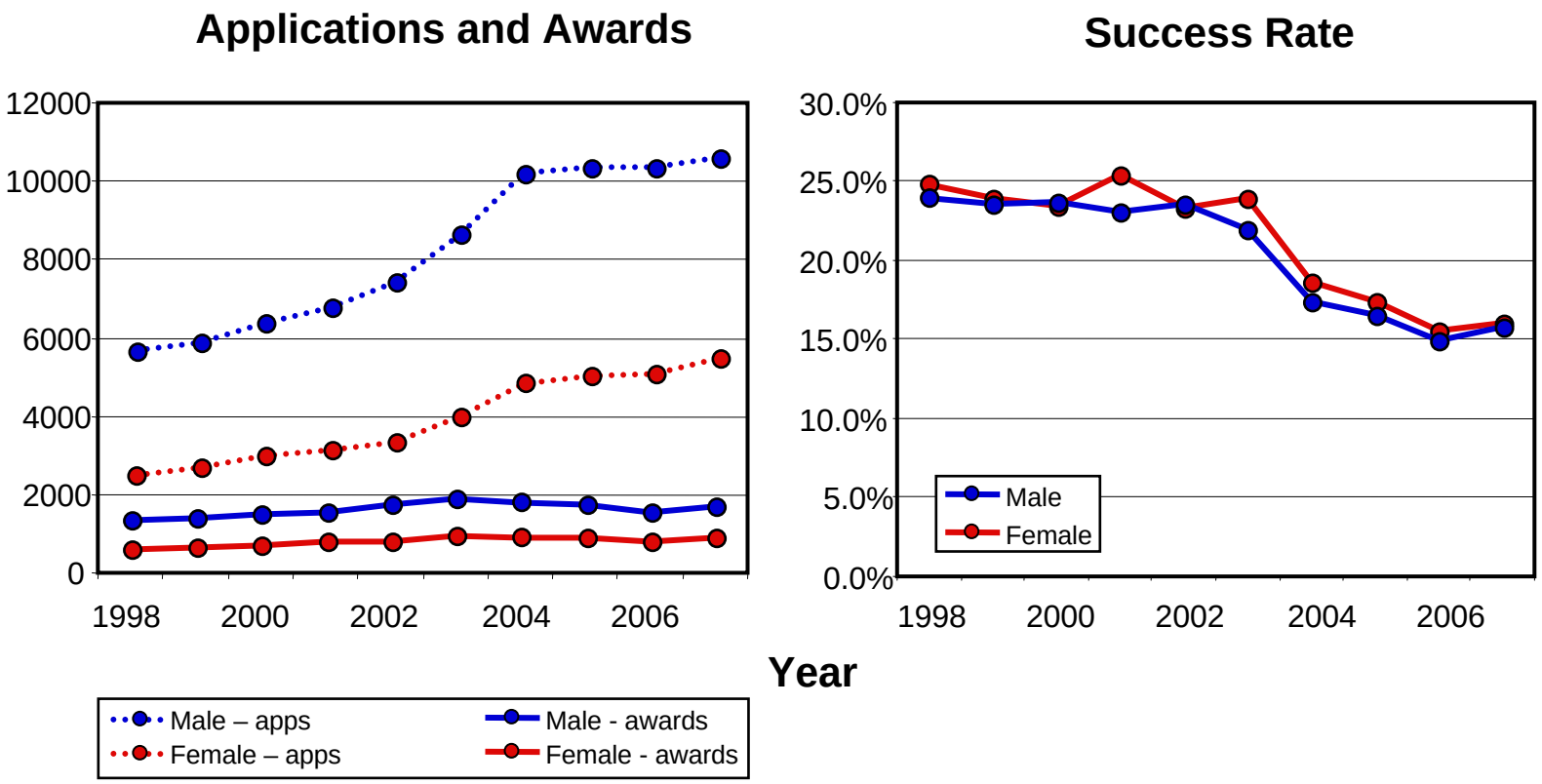
But the KO8 pool has only half as many female applicants!



And equal success rates for both genders and all degrees

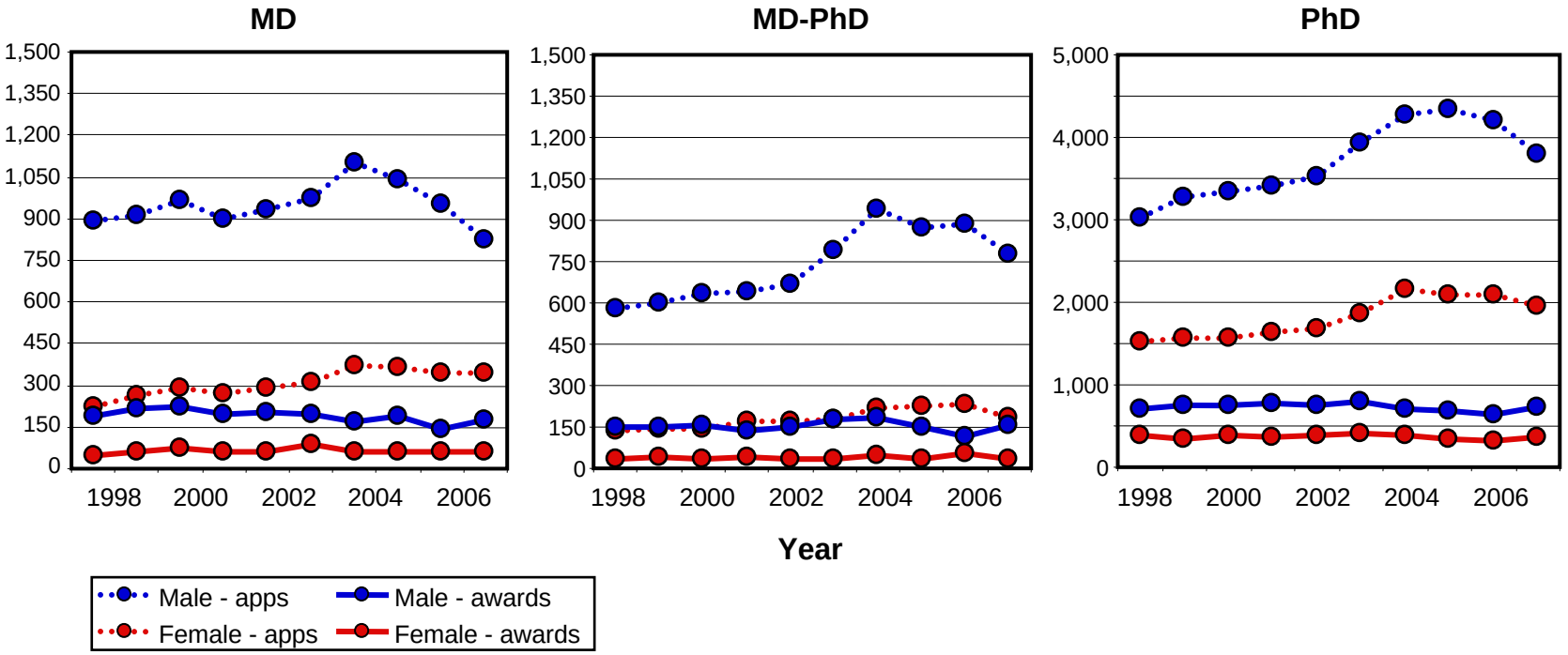


First Time RPG applicants:
Only half as many females apply

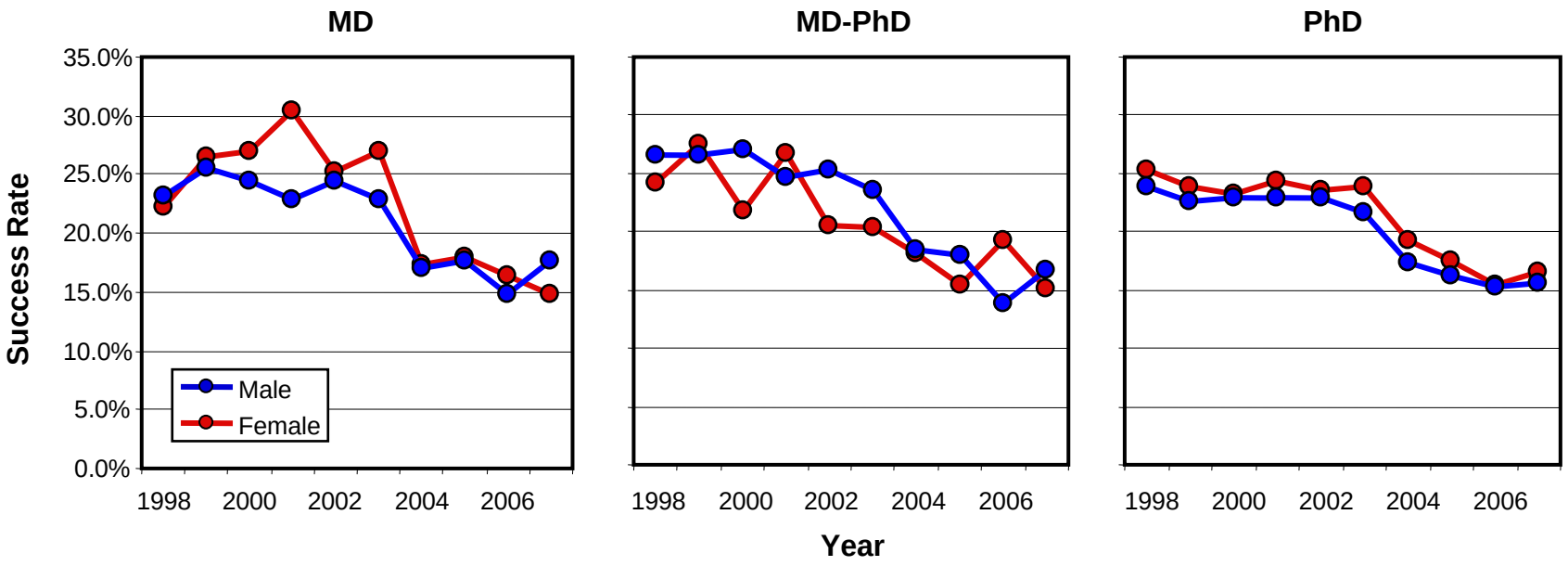


But they have equal success rates

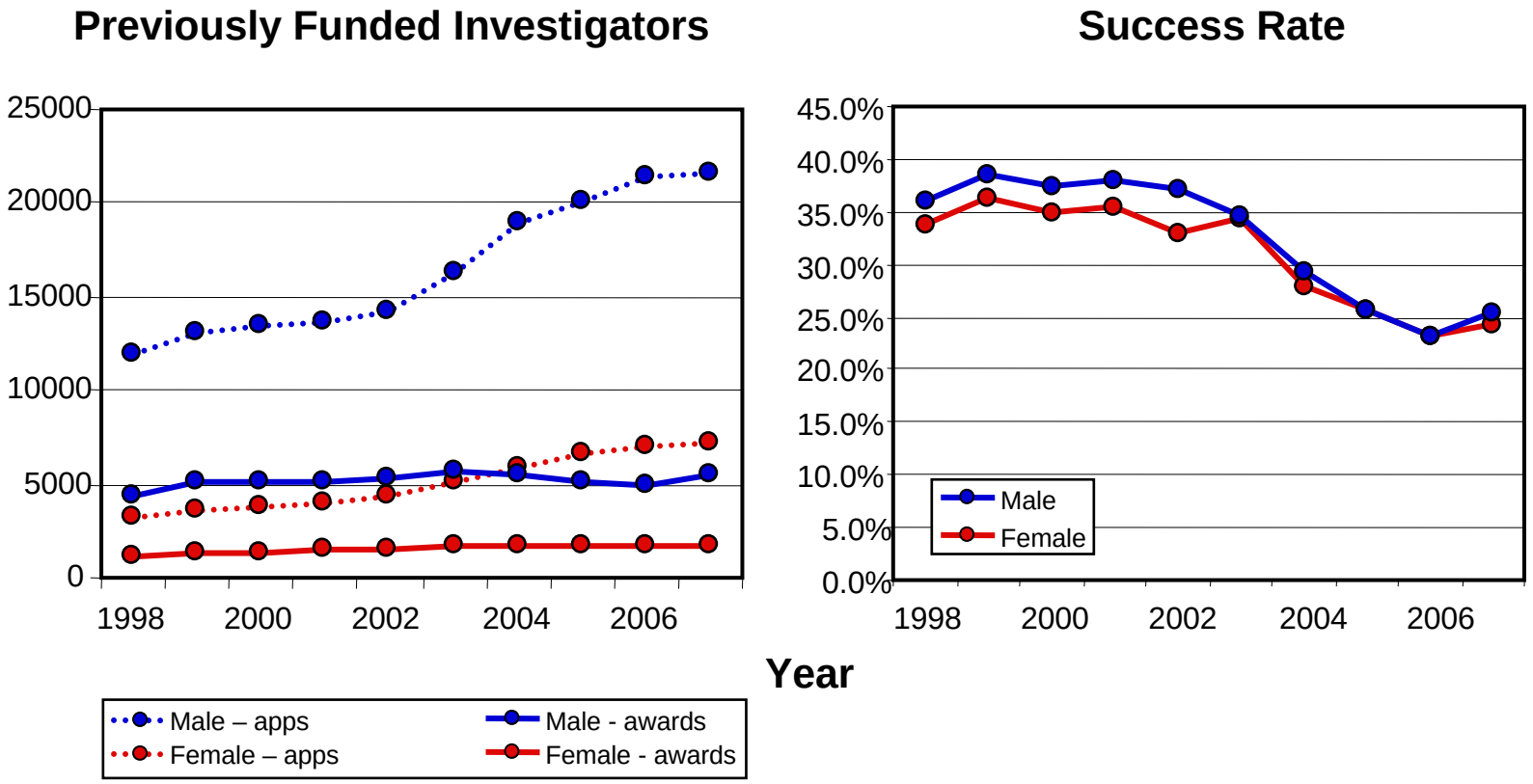
First Time R01 applicants:
Female physician-scientist applicant ratio is lowest



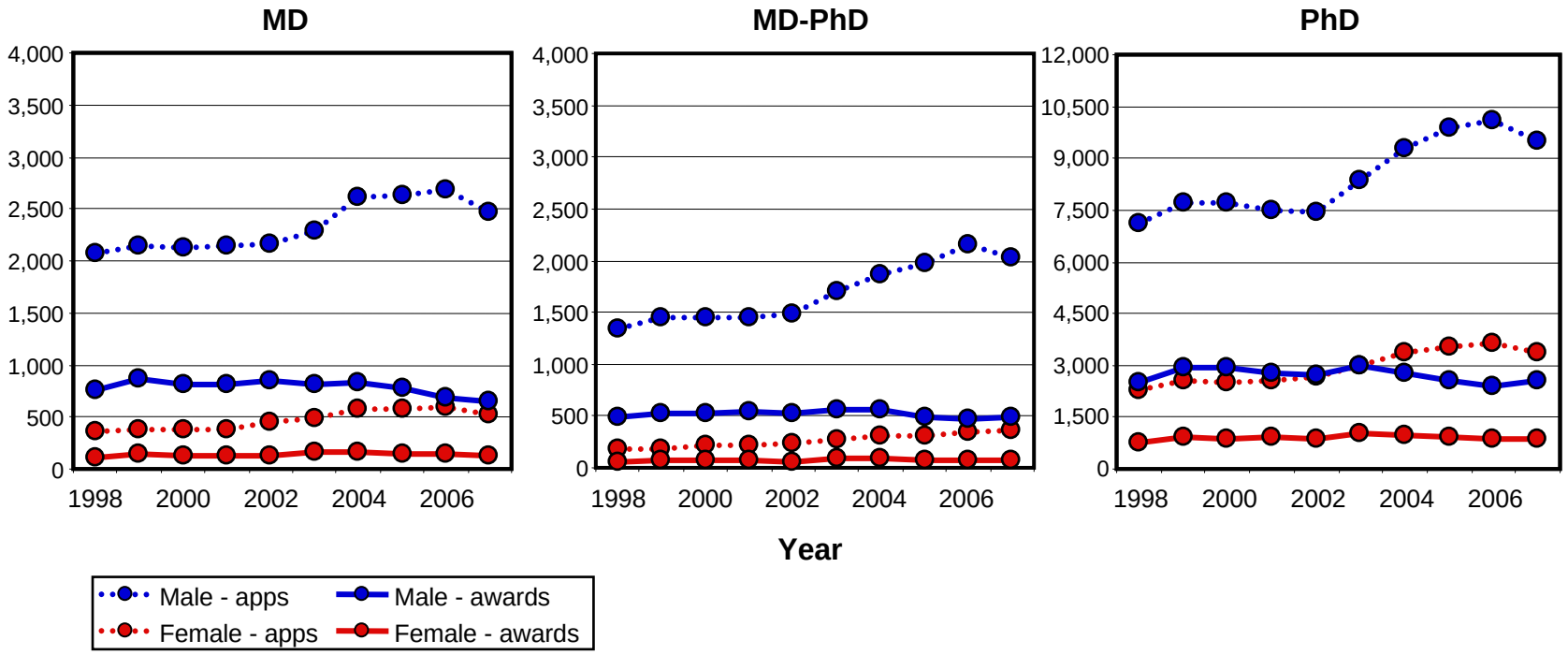
But equal success for **First Time** R01 applicants regardless of gender or degree



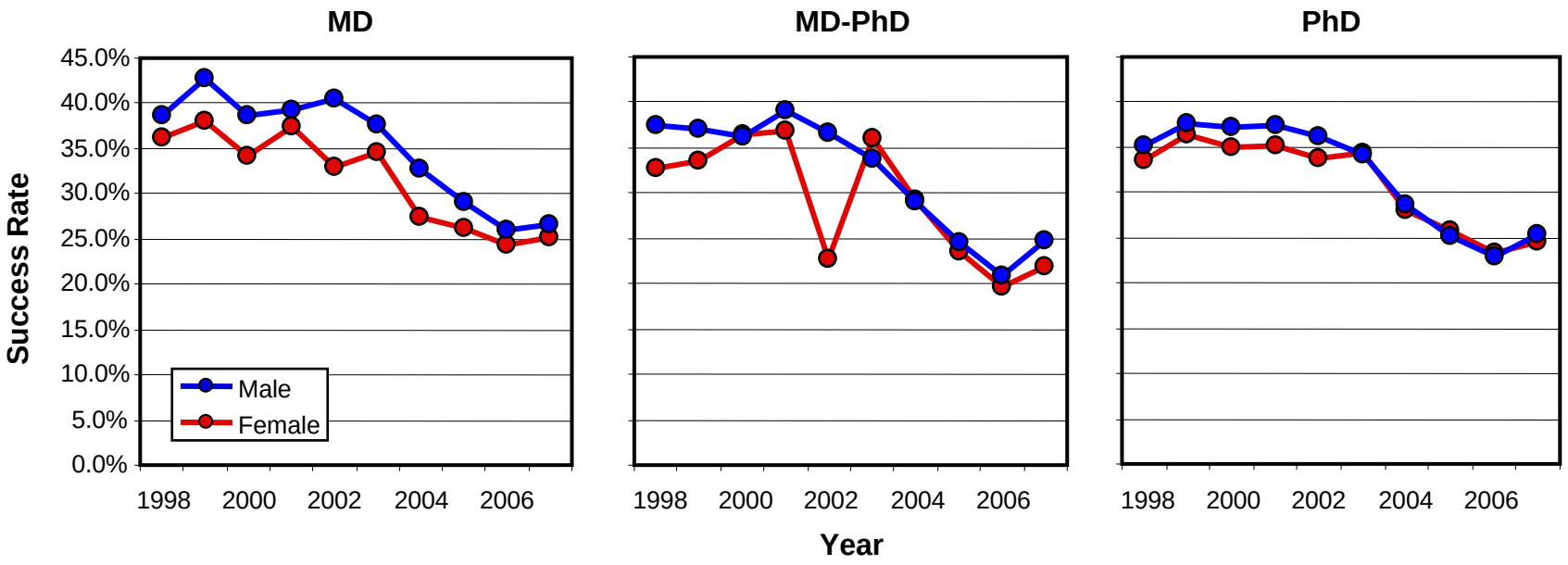
Attrition progresses with experienced investigators: Only ~1/3 as many **Previously Funded** female RPG applicants



In the **Previously Funded** R01 pool, progressive loss of applicants: worst for physician-scientists



Despite equal success for all degrees and both genders



Summary 1

- The number of US physician-scientists is currently at steady-state
- Changing age and gender demographics are creating potentially unstable conditions
  - Aging of the funded investigator pool
  - Disproportionate career attrition for women
- Equal numbers of men and women enter the career path, but women leave at ~2-3 times the rate
- Attrition is most severe for female physician-scientists

Summary 2

- Female career attrition starts at the late-post doc stage and is progressive
- Females who leave the career path apparently *choose* to do so, despite the fact that they are equally qualified, and equally successful at obtaining NIH funding at all stages

The undeniable reality in 2008:

- The academic medicine career path was created by men--for men--several generations ago in a highly patriarchal culture
- The basic organization of the career path has not changed since then
- Some experiments designed to change this trend have been initiated at local levels, but no significant change is yet apparent nationally
- A massive shift in the career culture of medical/graduate schools will be required to change these trends

LRP

K
awards

ROIs

Acknowledgements

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