Biomedical Workforce (BMW) Working Group
June 2012 Report Recommendation

BMW WG recommended that NIH conduct a follow-on study that focuses on physician-scientists:

• Different economic and educational drivers affect the training and career paths of the physician-scientist workforce than the PhD workforce

• Changing landscape of health care and its effects on academic medical centers will affect future physician-scientist workforce
Charge to the Physician-Scientist Workforce (PSW) Working Group

- Develop approaches that can inform decisions about the development of the U.S. PSW
- Analyze the size and composition of the PSW; consider impact of NIH funding policies
- Assess needs and career opportunities for PS trainees
- Identify incentives and barriers to entering the PSW
Who are Physician-Scientists?

• Scientists with professional degrees who have training in clinical care and who are engaged in independent biomedical research

• Individuals with MD, DO, DDS/DMD, DVM/VMD degrees and nurses with research doctoral degrees who devote the majority of their time to biomedical research
# PSW Working Group Roster

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Subcommittees

• Clinical/Translational PS (incl. Nursing PS)
• Lab-based PS
• Non-MD PS
  ○ Dentist PS
  ○ Veterinarian PS
• Data
Quantitative Research

• Analyzed individual-level data of physician-scientists vs applications data
  o Focused on ‘Applicants’ and ‘Award Rates’ (as opposed to ‘Applications’ and ‘Success Rates’)

• Large amount of aggregated individual-level workforce data is available with this report
Qualitative Research

- Focus groups and interviews
  - Medical, dental, and veterinary students
  - Young faculty
  - Deans of medical, dental & veterinary schools

- Questions on factors that influenced decision to pursue a research career
Physician-Scientist Workforce
Physician-Scientist Workforce

- NIH-Funded PS
- Academic PS funded by other sources
- Professional School Educators
- The invisible PSW
  - Pharma
  - Biotech

*MD/PhD includes: MSTP Programs grads; non MSTP MD/PhD Program grads; PhD and MD in series; PhD and/or MD obtained outside US
Physician-Scientists with MD/PhD Degree

- In 2012, only 13.4% MD/PhD applicants had prior MSTP support
- MSTP - higher RPG award rates (35.8% in 2012) than non-MSTP MD/PhDs (22.9%)
Physician-Scientist Pathway

MEDICAL/DENTAL/ NURSING/VETERINARIAN SCHOOL
T32 · T35 · F30 · F31

CLINICAL TRAINING, FELLOWSHIP, RESIDENCY, APPOINTMENTS
T32 · F32 · LRP · K08 · K23 · K12/KL2 · K99/R00

INDEPENDENT INVESTIGATOR
RPG · R01

JUNIOR FACULTY

SENIOR FACULTY

INDUSTRY RESEARCH

• NIH Success rate
• Demands on time
• Institutional support

• Time
• Mentoring
• Debt
• Regulatory Requirements

OTHER ACADEMIC OR GOVERNMENT RESEARCH ROLES

CLINICAL PRACTICE
The Physician-Scientist Pool is Stagnating

Figure 3.1. Number of Physicians Reporting Medical Research, Medical Education as Primary Practice Areas (2003-2012)

Total number of physician-scientists engaged in research unchanged over past decade
The Physician-Scientist Pool is Aging

Aging in PSW similar to BMW, but more pronounced
Gender Diversity Among Physician-Scientists

**MD physician-scientists**
- No difference in NIH RPG award rates – (2012): men 22.9%, women 23.8%
- But male applicants outnumbered female applicants ~3:1

**Nurse-scientists**
- Women RPG applicants outnumbered men ~9:1

**Dentist-scientists**
- Men outnumbered women ~3:1 in the workforce
- But women awarded almost one-third of the RPGs

**Veterinarian-scientists**
- 90% of current graduates are women
- But men outnumbered women ~3:1 among RPG recipients
Race/Ethnicity Differences Among MDs and MD/PhDs

- Significant growth of Asian and Hispanic awardees #s
- Less growth of African-American and Native American #s
Major Challenges for Physician-Scientists (1)

- Availability of research funding
- Average educational debt for 2013
  - For MDs: $175,000
  - For veterinarian-scientists: $162,000
  - For dentist-scientists: $220,000
- Increased length and complexity of training
- Work-life balance
- Clinical vs. research responsibilities
Major Challenges for Physician-Scientists (2)

- Particular obstacles for non-MD PS training
  - Primary educational focus is on producing clinical practitioners
  - Shortage of faculty members with scientific research programs as role models/mentors
  - Lack of research training infrastructure
Recommendations
Limitations

• Unresolved question about optimal research training
  - When/where should research training occur?
    - Before/during/after clinical training?
    - Exposure during or before college?
  - What dose of research experience is necessary/sufficient/optimal?

• No high quality data available to address these questions
#1: Sustain Strong Support for MD/PhD Programs

- MSTP - higher RPG award rates (35.8% in 2012) than non-MSTP MD/PhDs (22.9%)

- However, only ~13% of RPG-funded MD/PhDs were previously supported by MSTP!
#2: Shift NRSA Postdoc Training Awards to Support Proportionately More Individual Fellowships vs Institutional Grants

PSW-WG Finding:

Of 27795 T32 appointees (1999 -2008)

- 6500 (23.4%) applied for RPGs
- Award rate was 47.8%
#3: Continue to Address the Gap in R01 Award Rates Between New and Established Investigators

![Figure 3.24. Award Rate of Individual NIH R01 Applicants, MD Degree (FY1999-2012)](image)

![Figure 3.25. Award Rate of Individual NIH R01 Applicants, MD/PhD Degree (FY 1999-2012)](image)
#4: Develop More Effective Tools for Assessing the Strength of the Biomedical Workforce & Tracking Career Progress

- Establish standing committee to support the development and dissemination of biomedical workforce dashboard for real-time tracking
- Require rigorous reporting & tracking of outcomes of NIH awards
#5: Establish PS-Specific K99/R00-Equivalent Granting Mechanism

**K awards**

- >80% awardees applied for RPGs
- >60% award rate

**PS-Specific Pathway to Independence Award [K99/R00-type]**

- Longer period of support - lengthen R00 to 5 years
- Provide sufficient salary support
- Rigorously enforce minimum 75% effort protected time

*Figure 3.32. Individual NIH K99 Award Applicants, PhD, MD, and MD/PhD Degree (FY2006-2012)*

Current K99/R00 program funds almost exclusively non-MD PhD graduates
#6: Expand Loan Repayment Programs & Increase Dollar Amounts of Loan Forgiven

PSW-WG Finding:

Of 5303 LRP awardees (2003-2008)
- 2637 (49.7%) applied for RPGs
- Award rate was 47.0%
- Current limit is $35,000 per annum

Expand program to all students pursuing physician-scientist research careers regardless of research area or clinical specialty
#7: Support Pilot Grant Programs to Test Existing & Novel Approaches to Improve and/or Shorten Research Training

Average age of first-time RPG awardees (2012)

- **MDs**: 43.8
- **MD/PhDs**: 44.3
- **PhDs**: 41.9
#8: Intensify Efforts to Increase Diversity in the Physician-Scientist Workforce

- Perpetual deficiencies with regards to diversity
- Focused effort needed to address equity across many domains:
  - Age
  - Gender
  - Race/ethnicity
  - Disability
  - Others
#9: Leverage the Existing Resources of the CTSA Program to Obtain Maximum Benefit for Training and Career Development

• Is this resource being optimally utilized?
• Require rigorous trainee reporting and tracking
• Encourage testing of innovative pilot programs
• Extend to non-MD components of the PSW
Future Considerations (1)

• How to attract optimal candidates to enter the PSW?

• How to incentivize mentorship?

• How will the Affordable Care Act impact the PSW?

• What is the future role for multi-disciplinary teams in clinical research?
  
  o How to appropriately credit contributions from team members?
Future Considerations (2)

• What is the impact of foreign-trained PS and how is this changing?

• How can the PSW maintain clinical practice in light of:
  o Changing board certification requirements
  o Licensure requirements
  o Malpractice insurance
  o RVU system for clinical faculty

• Can robust data sharing be established among the major organizations collecting PSW data?
Useful Links


• Full set of data and graphs of the PSW Report will be accessible from NIH RePORT website at http://www.report.nih.gov/workforce.aspx
Thank you!