The Primary Care Physician Shortage

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US Has Huge Shortage of Primary Care Docs

Health care reform efforts may suffer

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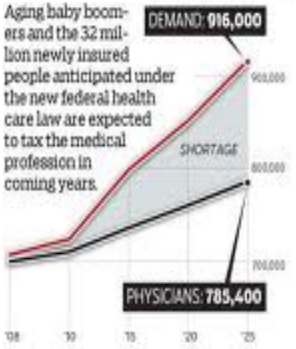
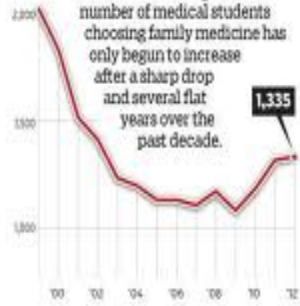
Physician Shortage

Aging baby boomers and the 32 million newly insured people anticipated under the new federal health care law are expected to tax the medical profession in coming years.



While demand for family physicians continues to grow, the number of medical students choosing family medicine has only begun to increase after a sharp drop and several flat years over the past decade.



SOURCES: Association of American Medical Colleges; American Academy of Family Physicians

Is the U.S. facing a severe primary care physician (PCP) shortage?

- Evidence of current shortage, particularly in rural areas
  - long waits to get appointments
  - 30% of privately insured individuals looking for a new PCP reported problems finding one in 2011.

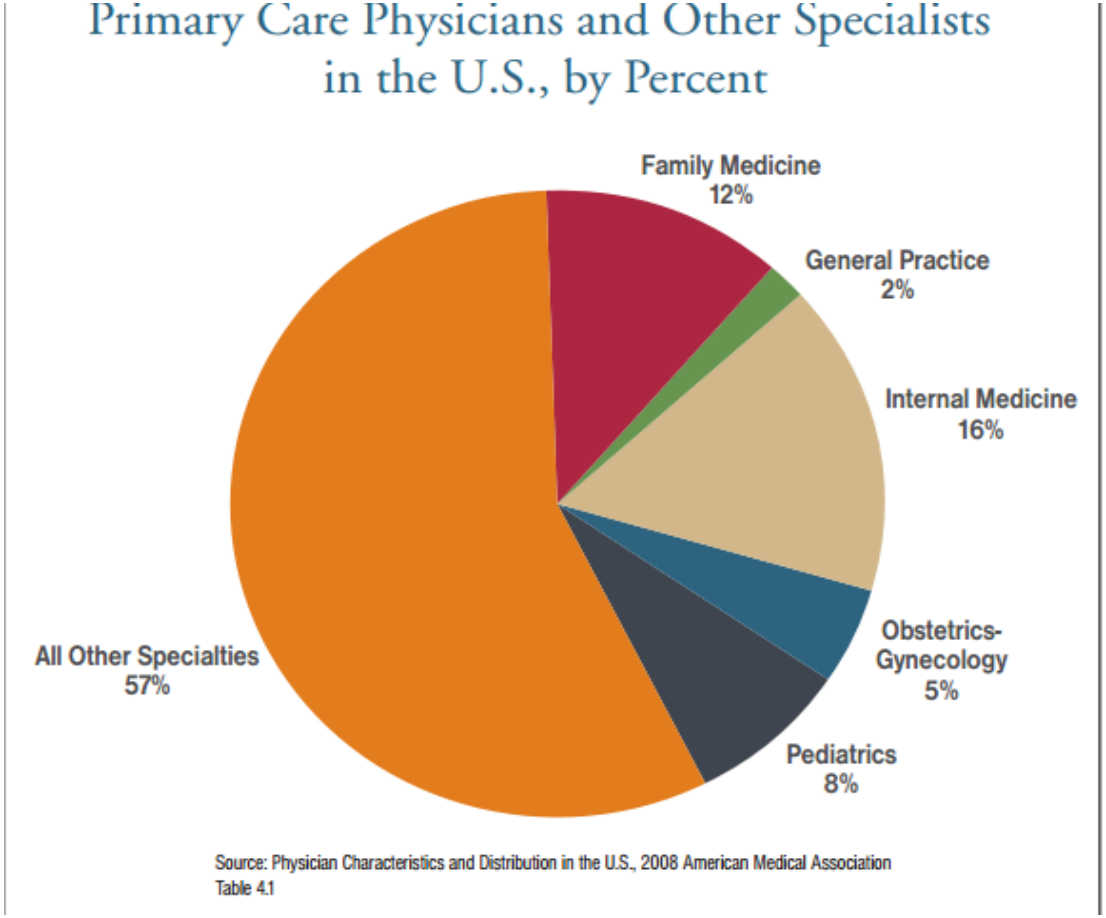
- Many studies have predicted a shortage of at least 44,000 physicians by 2025.
  - Aging population
  - Rise of chronic disease, e.g. diabetes, asthma
  - Increased insurance coverage due to Affordable Care Act (ACA)

Why may the PCP shortage become much worse?

- **Demand**: Based on estimates of population growth, aging, and increased of coverage due to the ACA, studies indicate an approximate **2% growth rate per year** in the number of visits which translates to **51% more visits in 20 years.**

- **Supply**: The long-term trend has been a diminishing fraction of graduating MDs entering primary care residencies. The supply of FTE PCPs, adjusted for age and gender, is projected to grow only about **2% in 20 years.**

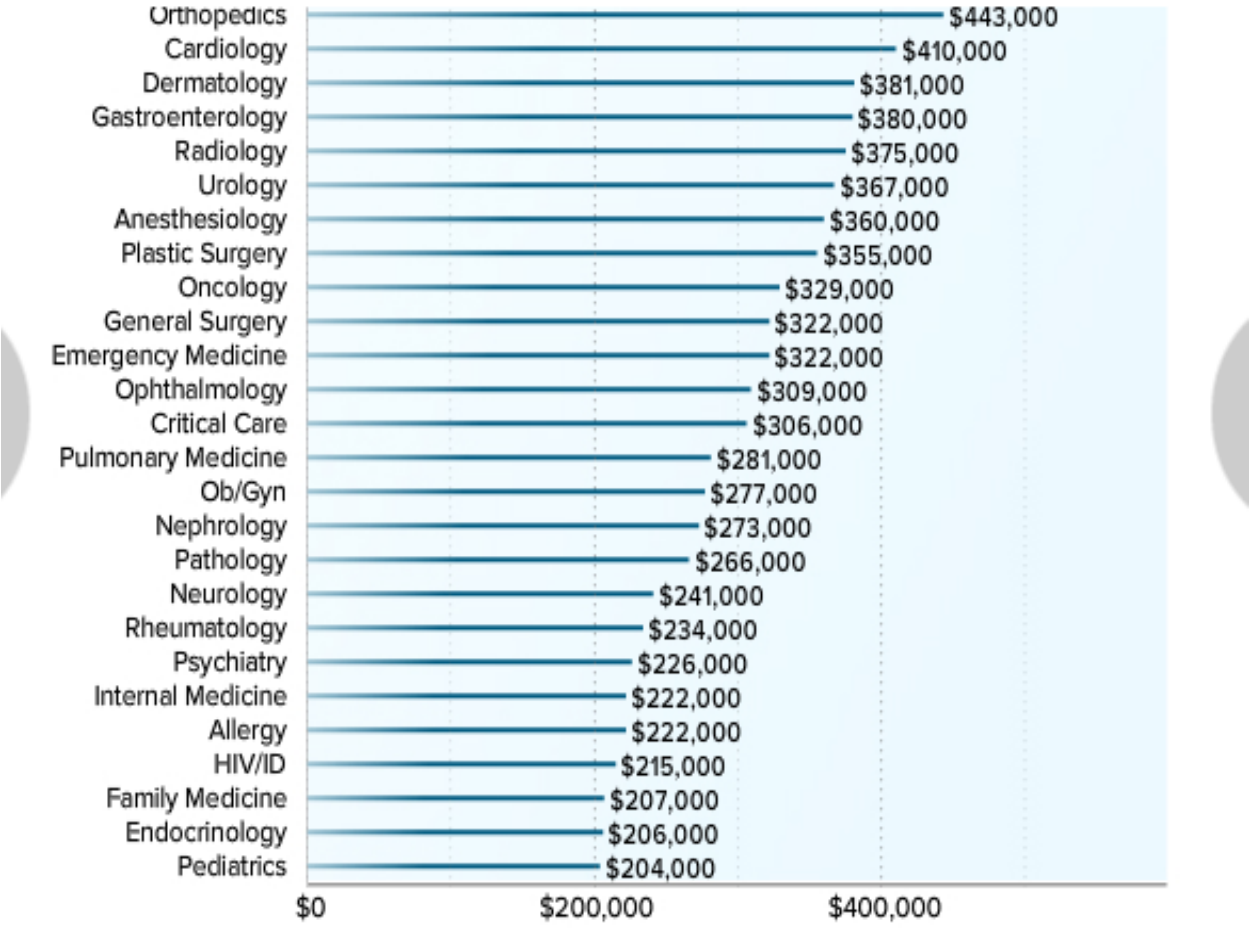
Most U.S. physicians are specialists



Overall, about 25% of physicians are PCPs. 20% of IM docs choose a generalist path. OB/GYNs estimate 30% of time devoted to primary care

Primary care compensation for patient care is lower than for specialties

Medscape Physician Compensation Report 2016



Why is the predicted PCP shortage of great concern?

- Regions with very low levels of PCPs per population have higher hospitalization rates.
- Access to primary care is associated with better health outcomes.
- People without a PCP have higher use of emergency departments – a cause of overcrowding.

Problems with previous studies on PCP shortage

- Based on assuming a fixed ratio of people per PCP, e.g. 2500 to 1.
- No consideration of timely access to care (One of the Institute of Medicine's 6 dimensions of quality healthcare.)
- Based on traditional PCP practice, i.e. solo practitioner.

Physician practices are changing

- Diminishing solo practitioner practices
  - Decreased from 39% in 2003 to 24% in 2008 to 17% in 2014.

- More use of non-M.D. professionals
  - Nurse Practitioners (NPs), 19% of PC workforce
  - Physician Assistants (PAs), 7% of PC workforce
  - Studies indicate that NPs and PAs can handle at least 60% of PCP visits.

- More team-based care, e.g. Medical Homes.

- Increasing use of electronic health records (EHRs) due to HITECH Act of 2009.
  - Kaiser Permanente study showed 25.3 % drop in PCP visits after EHR implementation facilitated substitution of telephone calls. More recently, this went up to about 50%.

Research Questions

- How many patients (i.e. what **panel size**) can a physician manage while providing timely access?

- Can patient panel sizes be increased without adversely affecting access to care?

- What operational changes would be needed to compensate for the increased demand due to the aging population, increased chronic disease, and the additional ACA insured population?

Our approach

- Estimate average daily visit rate for a "typical" PCP and the time needed per patient using data from 2 national physician surveys, adjusting for insurance status, age, etc.
  - NAMCS 2008
  - MEPS-HC 2007

- Consider practices with differing capacities, i.e. appointment slots per day.

- Use simulation to examine the impact on patient panel sizes of
  - physician pools or "pods" * and
  - NPs, PAs, and EHRs to "divert" a fraction of the demand.

***From queueing theory, systems with more "servers" can handle more customers per server without increasing delays.**

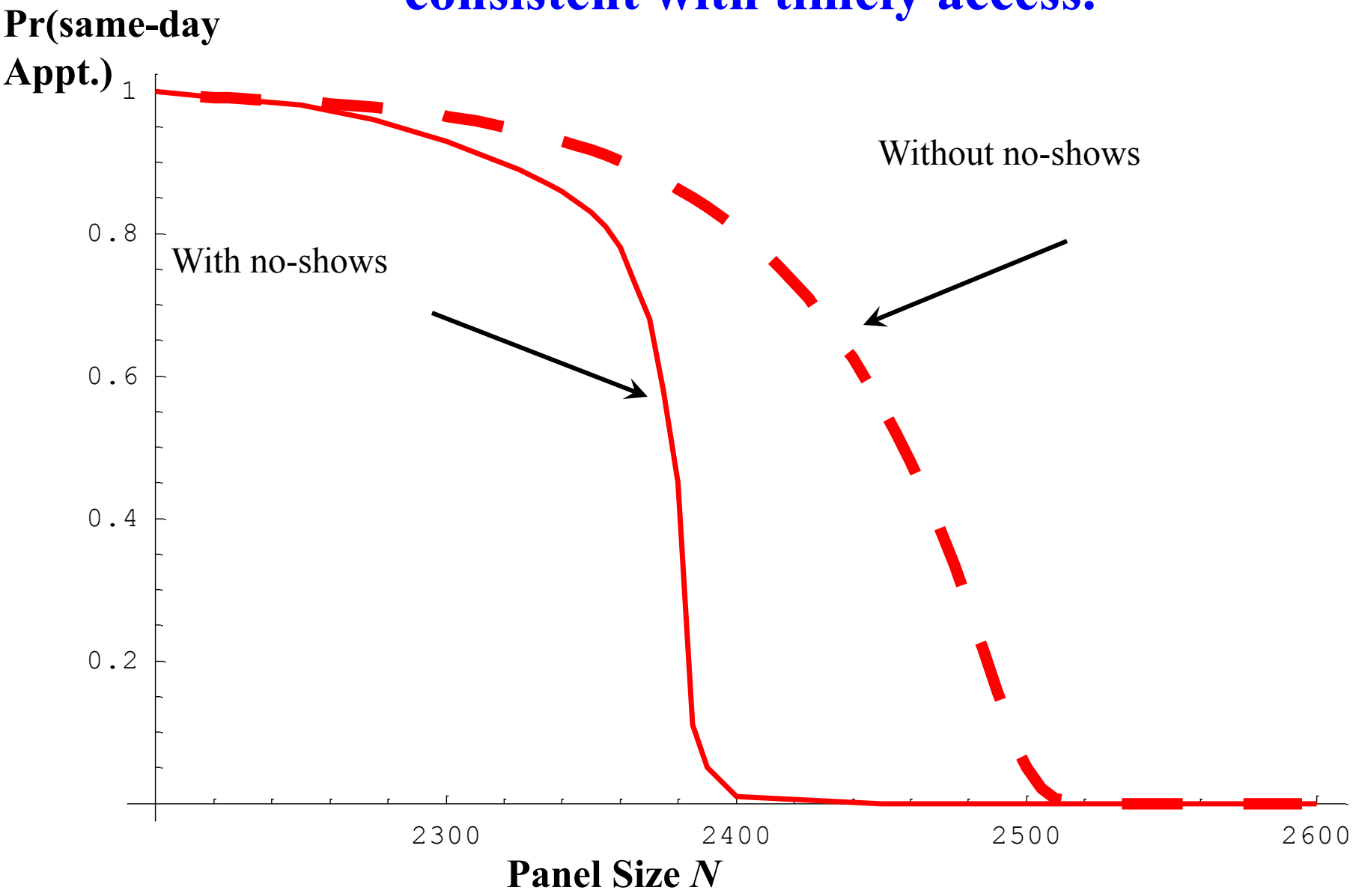
What about timely access?

We assume that Prob. (getting same-day appointment) = 75%.

- Consistent with "advanced access" model of healthcare.
- Consistent with studies showing 25% of patients do not want a same-day appointment.
- Previous work on impact of "no-shows" shows physician utilization decreases at lower levels of access.

  (Green and Savin *Oper. Res.* 2008)

No-shows have a big impact on panel size consistent with timely access.



How many patients can a physician handle?

Assumption: 75% get same-day appointments

Patient Diversion Fraction	Physician Pooling	*A*=20	*A*=24	*A*=28
=0%	Solo	1853	2315	2781
	Pool 2	2095	2568	3044
	Pool 3	2187	2665	3143
=10%	Solo	2110	2626	3145
	Pool 2	2358	2886	3414
	Pool 3	2453	2984	3516
=20%	Solo	2433	3016	3603
	Pool 2	2688	3282	3878
	Pool 3	2785	3383	3982
=30%	Solo	2850	3519	4192
	Pool 2	3112	3793	4476
	Pool 3	3211	3897	4582
=40%	Solo	3408	4193	4982
	Pool 2	3680	4476	5274
	Pool 3	3783	4582	5384

Physician pooling and demand diversion can significantly increase manageable* panel sizes.

(Green, Savin and Lu, *Health Affairs* Jan. 2013)

Patient Diversion Fraction	Physician Pooling	# of appointments per day per physician A=20	A=24	A=28
0%	Solo	1853	2315	2781
	Pool of 2	2095	2568	3044
	Pool of 3	2187	2665	3143
10%	Solo	2110	2626	3145
	Pool of 2	2358	2886	3414
	Pool of 3	2453	2984	3516
20%	Solo	2433	3016	3603
	Pool of 2	2688	3282	3878
	Pool of 3	2785	3383	3982

For example, 20% demand diversion combined with pools of 3 physicians could increase the manageable patient panel size by 46%.

*** Assuming 75% of patients get same-day appointments.**

What changes in PCP practices could compensate for the predicted shortage?

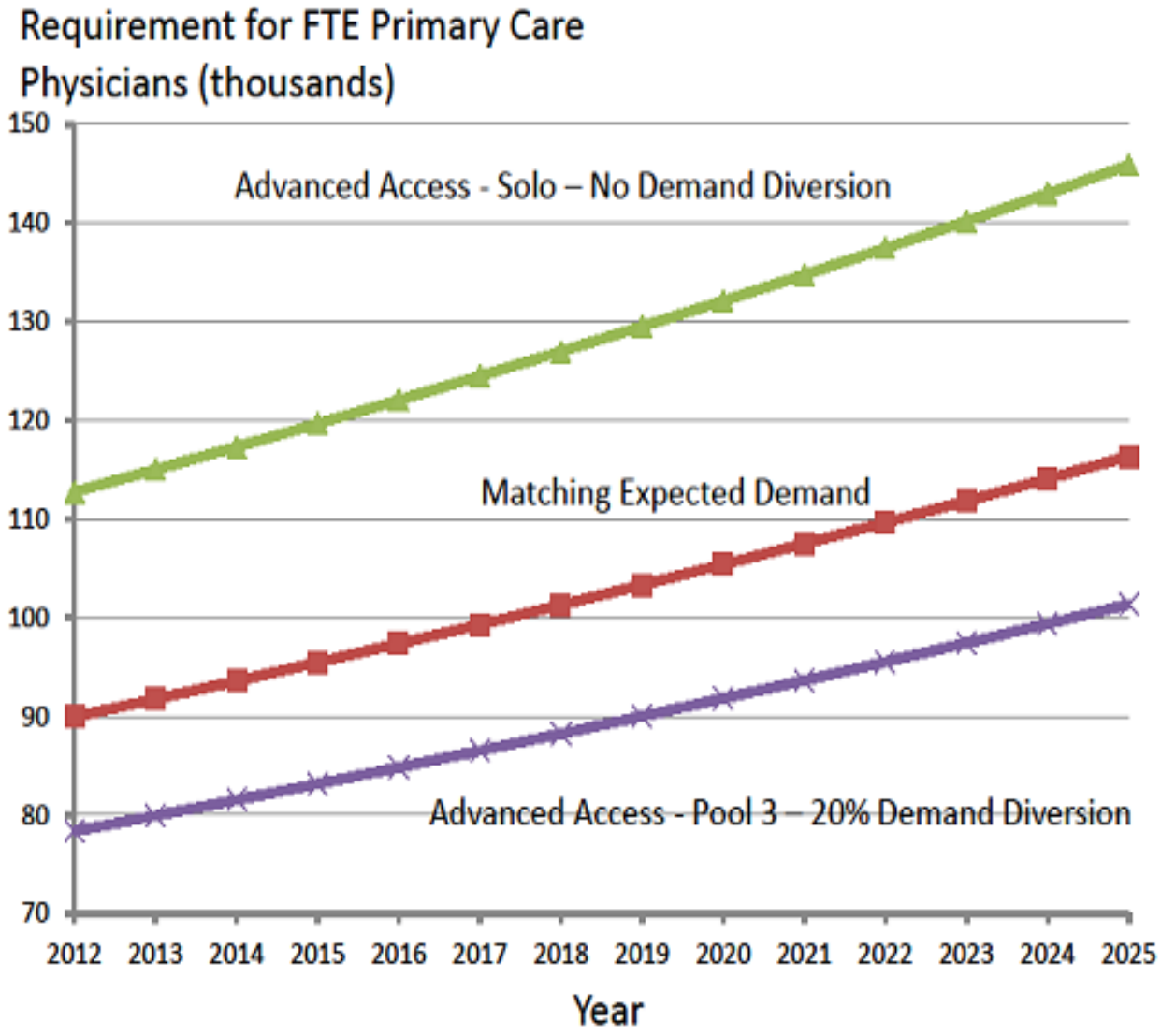
- Based on 24 appointment slots per day, our analysis indicates that a solo PCP can handle about **2315** patients under an advanced access system.

- To meet the disparity between growth in demand and growth in PCP supply, would require a patient panel size increase of

  $1.51/1.02 - 1 \approx$ **48%**

  or a panel size of **3427**

- This panel size can be achieved by either:
  - physician pods of size 3 and a 21% diversion rate or
  - physician pods of size 2 and a 23% diversion rate


Requirement for FTE Primary Care Physicians (thousands)
150
140
130
120
110
100
90
80
70
Advanced Access - Solo – No Demand Diversion
Matching Expected Demand
Advanced Access - Pool 3 – 20% Demand Diversion
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year

What if the no. of patients seen by a physician per day decreases?

- Team-based care may require more time for coordination efforts
- Average time per patient may increase due to more older patients with multiple chronic disease.

Assume: no. of appointments per day decreases from 24 to 20.

Then the required larger panel size can achieved by:

- physician pods of size 3 and a 34.1% diversion rate or
- physician pods of size 2 and a 35.9% diversion rate.

Caveats and Future Research

- Analysis is based on FTEs, while lots of physicians do not spend full-time on office-based visits
  - Visit hospitals, nursing homes
  - Some part-time practice

- Regional variation in physician supply per capita – likely to persist.

- Not all states allow NPs and PAs to operate independently.

- Impact of physician behavior? Patient behavior?

- Impact on quality, particularly for chronic disease patients.

Future Research

- How will physicians respond to a team approach?
- How will patients react to the increased use of non-MDs?
- How will these changes impact quality of care?
- **Demand vs. need** for care:
  - What fraction of visits are necessary?
  - How might this be affected by new technologies?
  - Are there "hidden" needs for care not reflected in current data, e.g. ED visits?