The Primary Care Physician Shortage

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Physician Shortage

US Has Huge Shortage of Primary Care Docs
Health care reform efforts may suffer

Help Wanted

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.
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

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.

\[ \text{Pr(same-day Appt.)} \]

With no-shows

Without no-shows

Panel Size $N$
How many patients can a physician handle?
Assumption: 75% get same-day appointments

<table>
<thead>
<tr>
<th>Patient Diversion Fraction</th>
<th>Physician Pooling</th>
<th>$A=20$</th>
<th>$A=24$</th>
<th>$A=28$</th>
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</table>
Physician pooling and demand diversion can significantly increase manageable* panel sizes.
(Green, Savin and Lu, *Health Affairs* Jan. 2013)

<table>
<thead>
<tr>
<th>Patient Diversion Fraction</th>
<th>Physician Pooling</th>
<th># of appointments per day per physician</th>
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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 $\frac{1.51}{1.02} - 1 \approx 48\%$
  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
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 be 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?