

**SPECIAL COMMUNICATION**

# A Primary Care Panel Size of 2500 Is neither Accurate nor Reasonable

Melanie Raffoul, MD, Miranda Moore, PhD, Doug Kamerow, MD, MPH, and Andrew Bazemore, MD, MPH

**Primary care panel sizes are an important component of primary care practices. Determining the appropriate panel size has implications for patient access, physician workload, and care comprehensiveness and will have an impact on quality of care. An often quoted standard panel size is 2500. However, this number seems to arise in the literature anecdotally, without a basis in research. Subsequently, multiple studies observed that a panel size of 2500 is not feasible because of time constraints and results in incomplete preventive care and health care screening services. In this article we review the origins of a panel size of 2500, review the subsequent work examining this number and effectively debunking it as a feasible panel size, and discuss the importance of primary care physicians setting an appropriate panel size. (J Am Board Fam Med 2016;29:496–499.)**

**Keywords:** Comprehensive Health Care, Primary Care Physicians, Primary Health Care, Research, Workload

It is difficult to accurately forecast the number of primary care physicians (PCPs) needed to serve a growing aging US population that has increasing access to health insurance. Workforce estimates are understandably disparate.<sup>1</sup> One of the key factors in such estimates is the number of patients a single PCP can reasonably manage.<sup>2</sup> To ensure that patients in the United States have adequate access to high-quality primary care through their medical home, it is important to determine an appropriate panel size.<sup>3,4</sup> A physician who has an appropriately sized panel can deliver more timely and comprehensive care to his or her patients, who are then more likely to be satisfied. Compared with PCPs who provide fragmented care (eg, in urgent care settings), PCPs who provide continuity of care to an appropriately sized panel of established patients are better equipped to address the individual needs of their patients; they also have more time available to coordinate care with subspecialists, improve

communication with their patients, provide behavior change counseling, evaluate quality, and monitor patient outcomes.<sup>3</sup>

## Is a Primary Care Panel Size of 2500 Patients Reasonable?

A primary care panel size of 2500 patients per physician is often cited as the standard. The original source of this figure seems to be an article from 2000 in which the authors speculated about the upper range of a panel size that could be reasonable under certain circumstances: “. . . the panel size for a full-time family physician taking care of his or her own patients in a mature system can be up to about 2500.”<sup>5</sup> This figure was not based on data or a review of actual physician panel sizes. A standard panel size of 2300 comes from a 2005 survey of physicians in concierge and nonconcierge practices<sup>6</sup>; this is less commonly cited.

Primary care teams are expected to provide preventive, acute, and chronic care to their panels. However, Americans receive only roughly 50% of recommended acute, chronic, and preventive care services.<sup>7</sup> This discrepancy is in part because of a lack of physician time. On average, family physicians address approximately 3 problems per visit.<sup>8</sup> It is estimated that a family physician would need 21.7 hours per work day to deliver recommended

This article was externally peer reviewed.  
Submitted 22 September 2015; revised 31 March 2016;  
accepted 18 April 2016.

From the Robert Graham Center, Washington, DC.

Funding: none.

Conflict of interest: none declared.

Corresponding author: Melanie Raffoul, MD, The Robert Graham Center, 1133 Connecticut Ave NW, Washington, DC 42435 (E-mail: raffoul.3@gmail.com).

care to a panel of 2500 patients.<sup>9</sup> This is one reason why prior work using a standard panel size of 2500 found this number of patients to be incompatible with the delivery of comprehensive care.<sup>9–11</sup> Studies have also found this panel size to be incompatible with the adequate management of chronic illness<sup>12</sup> and with the provision of all preventive care services.<sup>13</sup> By contrast, reducing the size of a PCP's panel has been shown to result in shorter patient wait times for empaneled appointments, longer visits,<sup>14</sup> and enhanced overall continuity of care.<sup>15</sup> Although these improvements lead to higher overall patient and physician satisfaction,<sup>16</sup> smaller panels may cause difficulties in finding a PCP. Continuity of care has been associated with improved preventive care, lower costs, and an improved experience for patients and physicians.<sup>3,17</sup>

### What Is the Average Panel Size for a PCP?

Recent studies of various practice settings in the United States and abroad found current panel sizes ranging from 1200 to 1900 patients per physician. For example, Kaiser Permanente reported a mean per-physician panel size of 1751 patients, and Group Health Cooperative of Puget Sound reported a panel size of 1490 patients per physician.<sup>18</sup> The US Department of Veterans Affairs reported a mean panel size of 1266 patients per full-time equivalent physician.<sup>19</sup> One study in Canada found a panel size of 1400 patients per PCP.<sup>20</sup> A study in Denmark found a maximum level of 1600 patients per physician,<sup>21</sup> and a study in England found 2033 patients per solo physician.<sup>22</sup>

Panel sizes of 900 to 1000 patients per physician are common in concierge or boutique practices.<sup>6</sup> In these models it is expected that physicians have more time to manage their patients and can offer improved access to care. These improvements are expected to lead to better health outcomes; however, concierge practices have yet to publish such data.

In a recent national study, only one third of family physicians could estimate their current panel size.<sup>23</sup> Many physicians in the public sector, especially those in the safety net setting, find it particularly challenging to determine their panel size because patients access ambulatory care sporadically, making accurate tracking difficult.<sup>24</sup> It is easier for physicians in the private sector to determine their panel size because of insurance payments and network selection.

Multiple sources recommend estimating current panel size by counting the patients who accessed care in the preceding 18 months.<sup>4,25</sup> For physicians in the public sector, a longer look-back period may allow for more accuracy.<sup>24</sup> Another approach is to use the following equation that sets demand equal to supply<sup>25–27</sup>:

Panel Size  $\times$  Visits per Patient per

$$\text{Year [Demand]} = \text{Provider Visits per Day} \times \text{Provider Days per Year [Supply]}$$

### What Factors Should PCPs Consider When Calculating a Reasonable Panel Size?

Once a physician has determined the current panel size, he or she can estimate an individual or practice-specific “ideal” panel size that would permit him or her to have a steady but manageable workload while offering assigned patients timely access to needed care. There is not a simple equation for determining an ideal panel size. Multiple factors must be considered, including factors specific to the patient population, the physician's personal needs, and the practice's finances and infrastructure.

The practice's patient population is a key consideration because utilization of services is shaped by the population's age, sex, race, disease burden, and other characteristics. Medical record data extraction or practice utilization data review can help a PCP assess the composition and the utilization patterns of his or her panel, as well as the intensity of services offered to different patient and population categories. Such methods can help identify the range of resources the practice allocates to a typical patient. It is also important to review community prevalence statistics to assess how vulnerable, utilization-intense populations (eg, patients who are homeless, patients who need substance abuse treatment, patients who have severe mental illness) might affect ideal panel size.

Primary care physicians must also consider how their individual financial needs and patient care preferences influence their ideal panel size. Another consideration is what number of patients will allow the physician to maintain “joy in practice.”<sup>28</sup> Burnout and lack of job satisfaction are indicators that a PCP's panel size has exceeded his or her capacity.

Once a PCP determines an ideal practice size, he or she must decide how to track progress toward achieving this ideal. Suggested metrics for assessing whether a PCP's panel size is optimal include the number of overbooked appointments per week and an access measure such as the average number of days between a request for an appointment and the third available appointment for that physician.<sup>27</sup>

Many have suggested that panel size capacity can be increased if practices tap the potential for improved efficiency (eg, using care teams or panel managers, adopting scheduling innovations, increasing telecommunication between physicians and patients, delegating appropriate tasks to non-physician clinicians).<sup>29</sup> Although there are potential avenues to increase panel sizes, research has not yet documented that PCPs can provide recommended care to a patient panel in the range of 2500.

### Why Is Primary Care Panel Size Important?

The Patient Protection and Affordable Care Act has increased the number of patients who have access to health insurance and are seeking a PCP. In addition, an increase in chronic disease burden is anticipated.<sup>12</sup> These are among the key reasons that the US health care system is expected to face a PCP shortage.<sup>1,2</sup>

Previous primary care workforce estimates have been modeled on an array of factors; however, panel size is rarely considered.<sup>2</sup> This factor can significantly change estimates. In a recent study that explored the sensitivity of a projected shortage of 33,000 PCPs by 2035, the authors highlighted the wide variation in their estimates that resulted from decreasing PCP panel size, approximated by the population-to-PCP ratio of 1400 patients per physician, by 10% (which increased the projected PCP shortage to 60,000) or increasing it by 10% (which decreased the projected PCP shortage to 6,000).<sup>2</sup>

A PCP shortage will likely increase impediments to accessing quality health care, especially if patients cannot find PCPs who are accepting new patients into their panels.<sup>29</sup> Physicians may experience pressure to increase their panel sizes to handle increased demand. However, the recent literature suggests that the average PCP is already narrowing his or her scope of practice, seeing more patients per hour, and facing tremendous risk of burn-out.<sup>30,31</sup> PCP want to be accessible to their pa-

tients, to get to know them over time, and to deliver high-quality care. Patients want to see their PCP in a timely manner, to feel like they are being heard, and to receive appropriate care. What physicians want aligns with what patients want: improved patient access and continuity of care. Case studies have shown that panel sizes <2500 and effective team pairing yield greater patient and physician satisfaction<sup>32,33</sup> and better health outcomes.<sup>33,34</sup>

### Conclusion

The appropriateness of the traditionally cited primary care panel size of 2500 patients per physician does not seem to be borne out in either study or practice. Our review suggests that current panel sizes in primary care are closer to 1200 to 1900 patients per PCP. Whether these are small enough to allow for optimal productivity, quality of care, and physician and patient satisfaction is unknown. This is likely to vary by patient population, practice structure, and community. Appropriate panel size deserves greater attention at the policy and practice levels if primary care is to function at its best for physicians and patients.

### References

1. Petterson SM, Liaw WR, Phillips RL Jr, Rabin DL, Meyers DS, Bazemore AW. Projecting US primary care physician workforce needs: 2010–25. *Ann Fam Med* 2012;10:503–9.
2. Petterson SM, Liaw WR, Tran C, Bazemore AW. Estimating the residency expansion required to avoid projected primary care shortages by 2035. *Ann Fam Med* 2015;13:107–14.
3. Bodenheimer T, Ghorob A, Willard-Grace R, Grumbach K. The 10 building blocks of high-performing primary care. *Ann Fam Med* 2014;12:166–71.
4. Murray M, Davies M, Boushon B. Panel size: how many patients can one doctor manage? *Fam Pract Manag* 2007;14:44–51.
5. Murray M, Tantau C. Same-day appointments: exploding the access paradigm. *Fam Pract Manag* 2000;7:45–50.
6. Alexander GC, Kurlander J, Wynia MK. Physicians in retainer (“conciierge”) practice. A national survey of physician, patient, and practice characteristics. *J Gen Intern Med* 2005;20:1079–83.
7. McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003;348:2635–45.
8. Beasley JW, Hankey TH, Erickson R, et al. How many problems do family physicians manage at each

- encounter? A WReN study. *Ann Fam Med* 2004;2:405–10.
9. Yarnall KS, Østbye T, Krause KM, Pollak KI, Gradison M, Michener JL. Family physicians as team leaders: “time” to share the care. *Prev Chronic Dis* 2009;6:A59.
  10. Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med* 2005;3:209–14.
  11. Altschuler J, Margolius D, Bodenheimer T, Grumbach K. Estimating a reasonable patient panel size for primary care physicians with team-based task delegation. *Ann Fam Med* 2012;10:396–400.
  12. Bodenheimer T, Chen E, Bennet HD. Confronting the growing burden of chronic disease: can the U.S. health care workforce do the job? *Health Aff (Millwood)* 2009;28:64–74.
  13. Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health* 2003;93:635–41.
  14. Brennan TA. Luxury primary care-market innovation or threat to access? *N Engl J Med* 2002;346:1165–8.
  15. Francia MD, Zahnd WE, Varney A, Scaife SL, Francis ML. Effect of number of clinics and panel size on patient continuity for medical residents. *J Grad Med Educ* 2009;1:310–5.
  16. Gross DA, Zyzanski SJ, Borawski EA, Cehul RD, Stange KC. Patient satisfaction with time spent with their physician. *J Fam Pract* 1998;47:133–7.
  17. Saultz JW, Lochner J. Interpersonal continuity of care and care outcome: a critical review. *Ann Fam Med* 2005;3:159–66.
  18. Weiner JP. Prepaid group practice staffing and U.S. physician supply: lessons for workforce policy. *Health Aff (Millwood)* 2004;Suppl Web Exclusives: W4-43-59.
  19. Huang PY, Yano EM, Lee ML, Chang BL, Rubenstein LV. Variations in nurse practitioner use in Veterans Affairs primary care practices. *Health Serv Res* 2004;39(4 Pt 1):887–904.
  20. Rosser WW, Colwill JM, Kasperski J, Wilson L. Patient-centered medical homes in Ontario. *N Engl J Med* 2010;362:e7.
  21. Pedersen KM, Anderson JS, Sondergaard J. General practice and primary health care in Denmark. *J Am Board Fam Med* 2012;25(Suppl 1):S34–8.
  22. Wang Y, O’Donnell CA, Mackay DF, Watt GC. Practice size and quality attainment under the new GMS contract: a cross-sectional analysis. *Br J Gen Pract* 2006;56:830–5.
  23. Peterson L, Cochrane A, Bazemore A, Baxley E, Phillips RL Jr. Only one third of family physicians can estimate their patient panel size. *J Am Board Fam Med* 2015;28:173–4.
  24. Marx R, Drennan MJ, Johnson EC, Hirozawa AM, Tse WM, Katz MH. Assessing and increasing patient panel size in the public sector. *J Public Health Manag Pract* 2011;17:506–12.
  25. College of Family Physicians of Canada. Best advice: panel size. August 2011. Available from: [http://www.cfpc.ca/Best\\_Advice\\_Panel\\_Size/](http://www.cfpc.ca/Best_Advice_Panel_Size/). Accessed December 10, 2015.
  26. Murray M, Davies M, Boushon B. Panel size: answers to physicians’ frequently asked questions. *Fam Pract Manag* 2007;14:29–32.
  27. Agency for Healthcare Research and Quality. Practice facilitation handbook. Module 20. Facilitating panel management. May 2013. Available from: <http://www.ahrq.gov/professionals/prevention-chronic-care/improve/system/pfhandbook/mod20.html>. Accessed December 10, 2015.
  28. Sinsky CA, Willard-Grace R, Schutzbank AM, Sinsky TA, Margolius D, Bodenheimer T. In search of joy in practice: a report of 23 high-functioning primary care practices. *Ann Fam Med* 2013;11:272–8.
  29. Bodenheimer T, Pham HH. Primary care: current problems and proposed solutions. *Health Aff (Millwood)* 2010;29:799–805.
  30. Potts B, Adams R, Spadin M. Sustaining primary care practice: a model to calculate disease burden and adjust panel size. *Perm J* 2011;15:53–6.
  31. Rabatin J, Williams E, Baier Manwell L, Schwartz MD, Brown RL, Linzer M. Predictors and outcomes of burnout in primary care physicians. *J Prim Care Community Health* 2016;7:41–3.
  32. Fernandopulle R. Restoring humanity to health care. *J Ambul Care Manage* 2014;37:189–91.
  33. Wu WN, Bliss G, Bliss EB, Green LA. Practice profile. A direct primary care medical home: the Qliance experience. *Health Aff (Millwood)* 2010;29:959–62.
  34. Phillips RL Jr, Bronnikov S, Peterson S, et al. Case study of a primary care-based accountable care system approach to medical home transformation. *J Ambul Care Manage* 2011;34:67–77.