Health Care Expenditures Attributable to Primary Care Physician Overall and Burnout-Related Turnover: A Cross-sectional Analysis

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Abstract

Objective: To estimate the excess health care expenditures due to US primary care physician (PCP) turnover, both overall and specific to burnout.

Methods: We estimated the excess health care expenditures attributable to PCP turnover using published data for Medicare patients, calculated estimates for non-Medicare patients, and the American Medical Association Masterfile. We used published data from a cross-sectional survey of US physicians conducted between October 12, 2017, and March 15, 2018, of burnout and intention to leave one's current practice within 2 years by primary care specialty to estimate excess expenditures attributable to PCP turnover due to burnout. A conservative estimate from the literature was used for actual turnover based on intention to leave. Additional publicly available data were used to estimate the average PCP panel size and the composition of Medicare and non-Medicare patients within a PCP's panel.

Results: Turnover of PCPs results in approximately $979 million in excess health care expenditures for public and private payers annually, with $260 million attributable to PCP burnout-related turnover.

Conclusion: Turnover of PCPs, including that due to burnout, is costly to public and private payers. Efforts to reduce physician burnout may be considered as one approach to decrease US health care expenditures.

Continuity of care between primary care physicians (PCPs) and their patients is associated with better patient outcomes, including diagnostic accuracy,[1] patient satisfaction,[2-4] fewer emergency department visits,[5,6] hospital admissions,[2,4,5] readmissions,[7,8] better care coordination,[9] improved end-of-life care,[10] reduced mortality,[11,12] and lower costs.[7,13,14] Given the importance of continuous care, disrupting care, such as through the loss of a PCP, can be costly. For instance, Medicare beneficiaries spend an additional $189 the first year after losing a PCP because of increased use of specialty, urgent, and emergency care.[15]

One of the more pervasive and preventable sources of disruptions to patient care is the occupational syndrome of burnout.[16-20]

The consequences of physician burnout are wide-ranging and include higher rates of physician turnover,[21-24] more frequent errors, lower quality,[24-32] and threats to physicians' well-being.[33] Physician burnout is also associated with higher malpractice claims,[34] reduction in clinical hours,[35] and other organizational costs.[36] Physician burnout affects society and the entire health care delivery system through higher costs of care and a reduced physician workforce.[21,37,38]

Prior work has focused on the effect of physician burnout on lost productivity as well as recruitment and replacement costs[36,37] but has not accounted for the greater health care expenditures that accompany a break in continuity between patients and their PCPs. In this report, we build on these studies to

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TABLE 1. Total Excess Health Care Expenditures Attributable to PCP Turnover, per PCP[a]

Panel size[42] per PCP	No. of Medicare patients per PCP[b]	Cost per PCP who turns over, for Medicare patients[c,d] ($)	No. of non-Medicare patients per PCP[e]	Cost per PCP who turns over, for non-Medicare patients per PCP[e] ($)	Total excess health care expenditures in first year per PCP who turns over[g] ($)
	A	B	C	D	E	F
1000	196	37,027	804	49,309	86,336

[a]PCP, primary care physician.
[b]Medicare patients per PCP: 62 million Medicare patients/316,471 PCPs = 196 (recognizing that these will not be evenly divided among all 3 primary care specialties). Sources: *A Dozen Facts About Medicare Advantage in 2020*[15] and American Medical Association Masterfile 2017. These numbers include both straight Medicare and Medicare Advantage.
[c]$189/Medicare patient × 196 Medicare patients (column B). (Sabety et al[15] found the excess expenditures for first year after exit = $189.)
[d]Individual cell values reflect rounding, and totals across categories may differ slightly as these are based on nonrounded cell values.
[e]Non-Medicare patients per PCP: 1000 (panel size per PCP) − 196 (Medicare patients per PCP) = 804.
[f]$61/non-Medicare patient (best conservative estimate) × 804 (column D). (See explanation and references in Table 4.)
[g]Column F = columns C + E.

estimate aggregate excess annual US health care expenditures due to PCP turnover, and burnout-related turnover specifically, for all US patients.

METHODS

Model Study Population
The American Medical Association (AMA) Physician Masterfile, a nearly complete data set of US physicians and medical students, was used to determine the number and distribution of physicians across primary care specialties for our simulation model. Primary care specialties were defined as family medicine, general internal medicine, general pediatrics, geriatrics, general medicine, general preventive medicine, and obstetrics/gynecology. These specialties were included to align with the methodology by Sabety et al[15] on which this analysis builds.

Burnout and Intention to Leave Current Practice
Data from a cross-sectional survey of 5197 US physicians conducted between October 12, 2017, and March 15, 2018, were used to estimate the prevalence of burnout and intention to leave one's current practice within 2 years (likely or definitely) by specialty.[16] Turnover intention is defined as the intent to leave one's current practice for any reason and could include seeking another practice, retiring, leaving medicine for another career, and taking an administrative role. It does not include reducing clinical effort within the same practice. Multiple longitudinal studies have demonstrated that physicians with burnout are twice as likely to actually depart their organization during the next 2 years.[22,24] Other published references evaluating the association between stated intention to leave current practice and future turnover have found that between 25% and 76% of those stating they intend to leave actually do so within the next 2 to 4 years.[22,24,39,40] On the basis of these publications, we assumed that 25% of physicians intending to leave their current position in the next 24 months would actually do so, the most conservative estimate in the literature.

TABLE 2. Excess US Health Care Expenditures due to PCP Turnover[a]

A	B	C	D	E	F	G
PCP specialty	Workforce[b]	Expressed intention to turn over in 2 years[c] (%)	Expressed intention estimated to actually turn over in 2 years (%)	No. of PCPs estimated to turn over every 2 years[d,e]	No. of PCPs estimated to turn over every year[e,f]	Excess health care expenditures[g] due to PCP turnover/year ($)
General internal medicine	106,260	33	25	8740	4370	
Family medicine	103,547	28	25	7248	3624	
General pediatrics	54,980	19	25	2639	1320	
Obstetrics/gynecology	38,007	33	25	3126	1563	
Geriatrics	5101	23	25	297	149	
Preventive medicine	2246	33	25	185	93	
General medicine	6330	28	25	443	222	
				—	—	
Total	316,471			22,679	11,339	979,007,542

[a]PCP, primary care physician.

[b]From Table 1 of the 2021 American Medical Association Masterfile.

[c]Likely or definitely leaving current practice (to another practice, retirement, administrative position, leave medicine). From *Mayo Clin Proc.*[21] (Supplemental Table; intention to leave for geriatrics and preventive medicine from unpublished data). Family medicine intention to leave was used for general medicine practitioners.

[d]Column D = columns B × C × 0.25 (0.25 is proportion of those who indicate an intent to leave who actually leave). From *Eur J Public Health.* 2011;21(4):499-503, *Health Serv Res.*,[39] and *Am J Manag Care.*[40]

[e]Individual cell values reflect rounding, and totals across categories may differ slightly as these are based on nonrounded cell values.

[f]Column F = column E × 0.5.

[g]Column G = Table 1, column F ($86,336) × Table 2, column F (11,339 PCPs exit/y) = $979 million.

TABLE 3. Prevalence of Burnout in PCPs[a]				
A	B	C	D	E
PCP specialty	Workforce[b]	Rate of burnout[c] (%)	No. of PCPs with burnout[d,e]	No. of PCPs without burnout[e,f]
General internal medicine	106,260	48.0	51,005	55,255
Family medicine	103,547	50.5	52,291	51,256
General pediatrics	54,980	41.3	22,707	32,273
Obstetrics/gynecology	38,007	51.4	19,536	18,471
Geriatrics	5101	55.0	2806	2295
Preventive medicine	2246	29.6	665	1581
General medicine	6330	50.5	3197	3133
Total	316,471	—	152,205	164,266

[a]PCP, primary care physician.
[b]From 2021 American Medical Association Masterfile.
[c]From Mayo Clin Proc.[16] (Supplemental Table 3).
[d]Column D = column B × column C.
[e]Individual cell values reflect rounding, and totals across categories may differ slightly as these are based on nonrounded cell values.
[f]Column E = column B − column D.

Panel Size and Composition

Average PCP panel size ranges from 1000 to 1400 patients in Veterans Affairs Patient Aligned Care Teams[41] to more than 2300 patients in nonconcierge practices, according to the literature.[42-44] We derived the average number of Medicare patients per PCP (196) by dividing the total number of Medicare patients in the United States (62.0 million in 2020)[45] by the number of PCPs in the AMA Physician Masterfile (316,471). The US Census estimate of the US population as of July 18, 2021, was 332.5 million,[46] which would equate to an average panel size of 1050 if every member of the US population was empaneled. We therefore used a conservative primary estimate of 1000 patients for the present analyses to conform with these data, recognizing that this is a lower panel size estimate than in most published literature. To determine the average number of non-Medicare patients per PCP (804), we subtracted the estimated number of Medicare patients per PCP (196) from the total estimated panel size (1000; Table 1). All calculations used nonrounded estimates where available at all intermediate steps.

Excess Health Expenditures for Patients Who Lose Their PCP

Sabety et al[15] estimated that Medicare patients generate an excess of $189 of health care expenditures in the first year after their PCP turns over. To estimate the first-year costs for non-Medicare patients who lose their PCP, we used 2019 estimates of the population younger than 65 years, composed of children (24% of the population) and adults aged 18 to 64 years (61% of the population).[47] We paired these population estimates with the proportional spending estimates for children (19.6% of Medicare costs) and adults aged 18 to 64 years (37.5% of Medicare costs)[47] and the prior estimate of $189 excess health care expenditures in the Medicare population, resulting in a weighted average of $61 per non-Medicare patient (Supplemental Table 1, available online at http://www.mayoclinicproceedings.org).

RESULTS

Excess US Health Care Expenditures due to PCP Turnover

Using the excess expenditures for Medicare ($189) and non-Medicare ($61) patients,

TABLE 4. Calculation of Total Excess Health Care Expenditures due to Patients' Losing Their PCP[a]	
Inputs	Estimate
Excess health care expenditures in Medicare population per PLP[15]	$189/y/PLP × 1 year
Relative risk of leaving current practice (burnout vs not)[21]	1.75
No. of practicing PCPs (general internal medicine, family medicine, pediatrics) in the United States[b]	316,471
Total excess first-year health care costs per PCP who leaves per year[c]	$86,336
No. of PCPs who leave current practice every 2 years[d]	22,679
Excess health care expenditures due to PCP turnover/year[e]	$979,007,542
PCP departure rate during 2 years[f]	7.17%
Departure rate during 2 years among those PCPs without burnout (x)[g]	5.27%
Departure rate during 2 years among those PCPs with burnout (y)[h]	9.22%
Attributable risk of turnover during 2 years due to burnout[i]	3.95%
PCPs who leave every 2 years with burnout/year[j]	14,028
PCPs who leave every 2 years without burnout[k]	8651
PCPs who leave every 2 years because of burnout[l]	6012
PCPs who leave every 1 year because of burnout[m]	3006
Total excess health care costs per year due to PCPs who leave current practice because of burnout[n]	$259,523,825

[a]PCP, primary care physician; PLP, patient who loses a primary care physician for any reason (relocation, premature retirement, exiting medicine).
[b]Primary care physician from American Medical Association Physician Masterfile (general internal medicine, family medicine, pediatrics, geriatrics, general medicine, preventive medicine).
[c]Table 1, column F.
[d]Table 2, column E total.
[e]Table 2, column G total.
[f]No. of PCPs in turnover per 2 years (Table 2, column E)/No. of PCPs in workforce (Table 2, column B).
[g]Departure rate during 2 years among those PCPs without burnout (x)
x = rate of departure in PCPs without burnout
y = rate of departure in PCPs with burnout
P_{NO} = PCPs without burnout = 164,266 (Table 3, column E)
P_{BO} = PCPs with burnout = 152,205 (Table 3, column D)
$[P_{NO} * x] + [P_{BO} * y]$ = Total No. of PCPs who leave (Table 2, column E)
Solving for x and y using data in Table 3, columns D and E:
$[164,266 * x] + [152,205 * 1.75x] = 22,679$
x = Table 2, column E total/[Table 3, column E + Table 3, column D*1.75]
y = 1.75x (from conversion of odds ratio to relative risk)
x = 0.0527 = 5.27%
[h]y = 0.0527 × 1.75 = 9.22%.
[i]9.22% − 5.27% = 3.95%.
[j]Table 3, column D × departure rate among PCPs with burnout (9.22%) = 152,205 × 0.0922 = 14,028.
[k]Table 3, column E × departure rate non−burned out (5.27%) = 164,266 × 0.0527 = 8651.
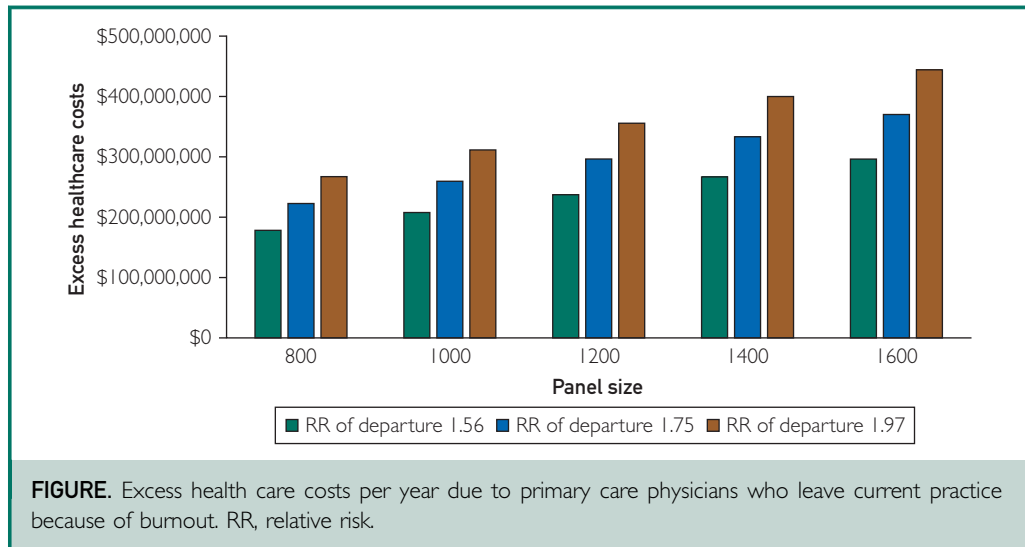[l]3.95% × No. of PCPs with burnout (Table 3, column D).
[m]Table 4, 6012 × 50%.
[n]PCPs who leave every year because of burnout × first-year cost per turnover.

we estimate that in the first year after leaving practice, the excess health care expenditures per PCP total $86,336 (Table 1). Using published data on intent to leave practice by specialty within primary care[21] and the conservative estimate of 25% turnover among those who express an intent to leave,

we estimate that 11,339 PCPs are expected to leave their current practice each year (Table 2). Combining this with estimated PCP turnover by specialty results in more than $979 million in excess health care expenditures due to PCP turnover each year (Table 2).

FIGURE. Excess health care costs per year due to primary care physicians who leave current practice because of burnout. RR, relative risk.

Excess US Health Care Expenditures due to PCP Burnout-Related Turnover

Of the 316,471 total PCPs, 152,205 are expected to experience burnout on the basis of national studies reporting the prevalence of burnout by primary care discipline (Table 3).[16] As noted before, 11,339 PCPs are expected to leave their current practice per year. Sinsky et al[21] determined that physicians with burnout have a 2.16 higher odds (95% CI, 1.81 to 2.59) of intending to leave their current practice, which is consistent with a doubling in the rate of actual turnover among physicians with symptoms of burnout in multiple prospective studies.[22,24] The proportion of physicians in that study intending to leave their practice in the next 2 years was 20.0% for physicians not experiencing burnout. Using this baseline prevalence for physicians without burnout, the odds ratio can be converted to a relative risk of 1.75 (95% CI, 1.56 to 1.97).[48] From these figures, the departure rate during 2 years is estimated to be 9.22% (14,028/152,205) for PCPs *with* burnout and 5.27% (8651/164,266) for PCPs *without* burnout. The difference between these 2 percentages (3.95%) is the risk of turnover during 2 years among physicians attributable to burnout (Table 4).

Applying this attributable risk to the number of PCPs with burnout (152,205) yields 6012 PCP turnovers in 2 years or 3006 PCP turnovers each year attributable to burnout. This leads to $260 million in excess health care expenditure attributable to burnout-related turnover in PCPs (Table 4), given a first-year cost of $86,336 per PCP who departs (Table 1).

Sensitivity Analyses

A sensitivity analysis was completed using different panel sizes and relative risks of turnover for physicians with burnout vs those without, spanning the 95% CI for the relative risk of a physician with burnout departing practice compared with a physician without burnout. The results of this analysis suggest that annual costs associated with excess health care expenditures attributable to burnout-related turnover range from $178 million to $444 million across these parameters (Supplemental Table 2, available online at http://www.mayoclinicproceedings.org; Figure). A calculator estimating the first-year excess health care expenditures due to PCP turnover with variable panel size and number of Medicare patients per PCP is available (Supplemental Table 3, available online at http://www.mayoclinicproceedings.org).

DISCUSSION

In this analysis, we estimate that each instance of a PCP's leaving current practice results in $86,336 in excess health care expenditures during the following year. We

estimate that PCP turnover results in $979 million in annual excess health care costs across Medicare and non-Medicare patients, of which $260 million (27%) is attributable to burnout. Physician burnout is therefore costly to public and private payers, who bear most of these excess health care costs.

There are multiple plausible reasons for the increase in health care expenditures observed when patients lose their PCPs. Continuity between patients and PCPs is important for quality of care[9,11,12] and patient satisfaction[4,3] as well as for total costs of care.[49] If care shifts to higher-cost venues, such as the emergency department rather than the ambulatory setting, costs rise. For example, given the greater trust[8,50] between patients and their physicians in an ongoing relationship, a course of observation may be more acceptable in the context of an established relationship, whereas an accelerated application of imaging and consultations may occur in the evaluation of undifferentiated symptoms outside of the context of an ongoing relationship. Finally, to the extent that patients replace primary care with non—primary care, they may receive more low-value care.[51]

The $260 million per year in excess health care expenses that is attributable to PCP turnover due to burnout identified in this study is distinct from the estimated $4.6 billion borne annually by health care organizations in costs attributable to burnout related to reduced productivity from vacant positions and the costs associated with replacing physicians.[37] Collectively, these costs would translate to a nearly $5 billion increase in health care expenditures each year due to burnout-related turnover costs. Uncounted in this estimate are additional costs related to other consequences of burnout, such as reduced patient satisfaction,[24,52,53] lower quality care,[54] medical errors,[28] associated morbidity and mortality,[55] and increased medical malpractice claims.[34]

There are related areas to consider for future study. For example, future research could quantify changes in health care expenditures when continuity is disrupted in non—primary care specialties.[56] In addition,

physicians experiencing burnout are more likely to reduce their clinical effort.[35] It is unknown how such reduction in clinical full-time equivalent affects panel size, continuity, and excess health care expenditures. Effects of PCP turnover on inpatient vs outpatient expenditures are also unknown. Beyond efforts to reduce burnout, strategies to promote smoother transitions for patients when PCP turnover occurs (regardless of cause) could increase safety and reduce costs.[57,58]

Although widespread, the current high levels of physician burnout are not inevitable. Interventions to improve practice efficiency, such as through advanced models of team-based care with in-room support,[59] can reduce burnout.[60—63] Likewise, interventions to improve organizational culture, including interpersonal connections with colleagues[64] and improved local leadership,[65,66] can improve professional fulfillment and reduce burnout. Detailed and evidence-based approaches to address these factors have been published with specific recommendations for payers,[67,68] government,[67,68] and health care organizations.[20,69—75] For example, the National Academy of Medicine consensus study *Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being*[67] contains specific recommendations for how health care organizations can create positive work environments, reduce administrative burden, and enable technology solutions. The AMA Joy in Medicine Health System Recognition Program[76] and De-Implementation Checklist[77] provide a roadmap with specific strategies for how to demonstrate commitment to promote physician well-being, to measure physician satisfaction and burnout, to improve efficiency of practice, to promote participatory leadership and teamwork, and to build support among colleagues at work.

Our study has several limitations. First, we assumed that excess health care expenditures for the non-Medicare population were proportional to total health care expenditures by population segment. We ideally would have been able to rely on previous work for this estimate, but the literature to date has been silent on excess health care

expenditures attributable to the loss of a PCP in the non-Medicare population. Second, we assumed that the average PCP has a panel size of 1000 patients. For a full-time PCP, this is likely to be a conservative estimate that underestimates the true costs of PCP turnover, especially among PCPs with larger panels. However, the intentional underestimate of panel size helps to address additional issues, such as physicians who work or act in primary care roles part-time and patients who are not empaneled with any PCP. Third, we estimated the distribution of Medicare and non-Medicare patients to be the same across all PCPs, whereas this is likely to vary by primary care specialty. Fourth, we used an actual departure rate on the lower end of existing data, potentially underestimating the costs of PCP turnover. To address this fact, we conducted sensitivity analysis to provide a range of possible costs (Supplemental Table 2). Fifth, we used the most recent data available for PCP specialty distribution (2021), burnout rates (2017),[16] and intention to leave based on burnout (2014),[21] and thus the data points originate in different years. Finally, we did not estimate the excess expenditures incurred by patients who lose their PCP when the PCP reduces clinical effort to part-time.

CONCLUSION

Turnover of PCPs leads to an additional $979 million in annual excess health care costs across the US population, with $260 million (27%) being attributable to burnout. Reducing physician burnout could therefore reduce unnecessary health care expenditures. Payers, health care organizations, and the health care delivery system have a vested interest in making changes to reduce physician burnout.

SUPPLEMENTAL ONLINE MATERIAL

Supplemental material can be found online at http://www.mayoclinicproceedings.org. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

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