Population experiences of primary care in 11 Organization for Economic Cooperation and Development countries

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Accepted 17 August 2015

Abstract

Objective: To develop a measure of individual user assessments of primary care and test its association with health system performance and quality indicators.


Setting: Australia, Canada, France, Germany, Netherlands, New Zealand, Norway, Sweden, Switzerland, the UK and the USA.

Study Participants: 20,045 respondents.

Main Outcome Measures: Individual report of financial protection (out of pocket expenses over USD 1000), lack of receipt of appropriate/timely care (use of the emergency room in the past 2 years, having consulted three of more doctors in the past year) and clinical prevention (blood pressure check in the past year, cholesterol checked in the past 5 years, receipt of influenza vaccination in past year and report of any medical error).

Methods: A score of users’ primary care experiences was constructed from 14 individual survey questions. Multivariable Poisson and augmented inverse-probability weighted regression assess the relationship between the primary care experience score and outcomes.

Results: Countries differed regarding the proportion of the population experiencing problems with primary care. In analyses controlling for age, sex, health status, chronic disease, income level and health insurance, users experiencing poorer primary care were significantly more likely to report significant out of pocket expenses, emergency room use in the past 2 years, having consulted more than three doctors in the past year, lower likelihood of blood pressure or cholesterol screening, an annual flu shot and higher reports of medical error.

Conclusions: The measure of individual primary care experience can be used to differentiate among different country’s primary care approaches and is strongly associated with overall health system performance and quality indicators.

Key words: health systems, primary care, healthcare quality
Introduction

Significant progress has been made in improving health in many Organization for Economic Cooperation and Development (OECD) countries. Unfortunately, these gains are threatened by trends such as increasing obesity rates, the rise of non-communicable diseases and the worsening of health inequalities in some populations [1, 2]. In response, many countries have made commitments to reinforce health systems by strengthening primary care quality and accessibility, among other approaches [3–5].

International evidence suggests that countries with health systems based on a strong primary care orientation may have better and more equitable health outcomes and higher user satisfaction than those whose health systems have only a weak primary care orientation [6, 7].

Despite these potential benefits and in light of recent evidence that stronger primary care is not associated with lower costs overall, but rather lower healthcare cost growth over time [7], governments may question the wisdom of investing in primary care rather than other types of care or even different areas of the economy. New evidence of primary care effectiveness could help support such investments, but the current evidence base is somewhat limited by its reliance on ecological or macro-level data. In particular, there is a dearth of evidence demonstrating the relationship between individual assessment of primary care experiences and health system performance and quality.

This study contributes to the evidence based on the quality and value of primary care by assessing the relationship between user experience of primary care and achievement of several indicators of health system performance in a large population-based sample of healthcare users in 11 OECD countries. It seeks to demonstrate that the use of such surveys in cross-national samples can be an important complement to other methods of evaluating and comparing healthcare quality.

Methods

Since 1998, the Commonwealth Fund has conducted surveys to collect nationally representative data on citizens in several OECD countries to assess how well different systems perform on a number of features. The International Health Policy Surveys (IHP) focus on the general population and are supplemented in subsequent years by surveys of adults with chronic health conditions, and surveys of primary care providers in the same countries [8, 9]. The most recent general population surveys took place in 2013 and included 20 045 adults aged 18 and older in Australia, Canada, France, Germany, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the UK and the USA. The survey methodology and descriptive results have been described elsewhere [10, 11].

In order to assess the contribution of primary care to health system performance, we developed a measure of primary care experience using 14 self-reported primary care items from the 2013 IHP survey. These items are described in Table 1. Selection of each item was based on literature defining the attributes of effective primary care and a review of existing instruments designed to measure each of these primary care functions [12–15]. Relevant primary care domains reflected in our final measure include: accessibility/absence of barriers to receiving care; longitudinal/continuous care; coordination of healthcare by the primary care unit; and primary care provider communication, interpersonal relations and cultural competence [16, 17].

All survey items were similar for each country, except for the question on waiting time for a general practitioner appointment, which was asked of a different subset of respondents in Switzerland. A few questions differed between countries primarily by response options, so these were recoded, and all variables were defined to reflect negative experiences or problems. To operationalize the measure, we used an iterative process comparing model fit starting with a continuous count of primary care problems and a binary variable (at the 75th percentile, based on the distribution of primary care problem scores). The continuous measure showed evidence of a nonlinear relationship, and the binary measure was inadequately sensitive to some outcomes. As a result, we created a categorical variable with cut points at 0, 1, 2–3, 3–4 and 5 or more problems. These cut points were defined based on the overall distribution of the score, model fit (differentiation between each category in bivariate models) and adequate cell sizes for each category for each country. The final measure combining all 14 variables showed reasonable internal reliability (standardized Cronbach alpha was 0.71 and tetrachoric factor analysis resulted in one main factor).

Outcome variables were chosen from the limited set available in the secondary data, and their selection was guided by the World Health Organization’s model of health system performance and the OECD health system quality framework, among others [18, 19]. Main outcomes include financial protection (measured by the proportion of the population reporting the equivalent of out of pocket (OOP) expenses in the past year of over USD 1000), lack of receipt of appropriate and timely care (use of the emergency room in the past 2 years, of primary care experiences and health system performance and quality.

| Table 1 Individual characteristics, health system performance and primary care problems |
|---------------------------------|------------------|------------------|
| Individual characteristics     | Proportion (95% CI) |
| Age (mean years)               | 47.87 (47.54, 48.21) |
| Sex (female versus male)       | 51.45 (50.51, 52.40) |
| Health insurance               | 45.62 (44.71, 46.51) |
| Income (% below country median income) | 37.69 (36.77, 38.61) |
| Poor self-rated health          | 14.84 (14.19, 15.49) |
| One chronic condition (versus none) | 24.68 (23.87, 25.49) |
| Or more chronic (versus none)   | 29.21 (28.38, 30.05) |
| Health system performance measures |
| OOP > USD 1000 equivalent in past year | 15.71 (15.03, 16.38) |
| ER use in the past 2 years      | 13.37 (12.69, 14.03) |
| Use of three or more doctors in past year | 27.26 (26.42, 28.09) |
| BP checked in past year         | 76.56 (75.72, 77.39) |
| Cholesterol check in past year  | 74.01 (73.12, 74.91) |
| Flu shot in past year           | 33.22 (32.36, 34.09) |
| Report of any type of medical error | 10.60 (9.98, 10.74) |

Results are population proportions and 95% confidence intervals that control for sample design and incorporate sample weights.
having consulted three or more doctors in the past year) and four clinically oriented quality measures (having had blood pressure and cholesterol checked in the past year and past 5 years, respectively; receipt of an annual influenza vaccination and the report of having experienced any medical error).

We tested the predictive value of the primary care problem score using robust Poisson regression since the outcomes analyzed were binary but had a prevalence of >10% [20]. Statistical models included the following covariates: sex, age categories (20–24, 25–34, 35–49, 50–64, 65+), income (whether the person is below or above the national median income), possession of health insurance and healthcare needs (fair/poor self-rated health compared with good/very good/excellent health and the number of self-reported chronic conditions). Country fixed effects (dummy variables for each country with Australia arbitrarily chosen as the reference category) represent unmeasured time-invariant country-level characteristics [21]. Results take into account the complex sample design and include sample weights. Sensitivity tests using multilevel models with country random effects produced virtually identical results to those presented here.

To enhance the comparability of results across different countries and to reduce potential common source bias (due to individual factors such as education that might simultaneously affect recall of outcomes and reporting of primary care problems), we used augmented inverse-probability weighted (AIPW) regression to assess the average treatment effect (or ATE) of each level of the primary care problem scale on each outcome [22]. This technique involved several steps: estimating parameters of the treatment model (in this case, the categories of the primary care score using a multinomial logit), computing inverse-probability weights based on this first step, estimating regression models for each treatment level and, finally, computing the inverse-probability weighted means of the treatment-specific predicted outcomes [23, 24]. All control variables listed above were included in both stages, except for country fixed effects, which were used only in the regression models for outcomes. We reported results for the ATE in comparison with the reference category of no primary care problems. Inspection of graphs (See Appendix Figure 1) displaying the distribution of treatment and control groups by propensity score showed substantial overlap and little clustering around 0 or 1, suggesting that key assumptions were met [25].

Results

Table 1 presents individual characteristics of the survey respondents. The average age was 48 years, and slightly more than half of respondents were female. Nearly half (46%) of respondents had private health insurance in addition to or in place of other (primarily public) health coverage. Nearly 38% of respondents reported incomes below the national median. In terms of health status, about one-sixth of respondents reported being in poor health, one-quarter had one chronic condition and nearly one-third had two or more chronic conditions. In terms of health system performance measures, about one-sixth reported OOP expenditures over USD 1000 and use of emergency room in the past 2 years. Nearly 30% used three or more doctors in the past year whereas three-quarters received blood pressure and cholesterol exams and one-third reported receiving a flu shot in the past year. Only ~11% report having experienced a medical error.

Table 1 also shows the distribution of each of the 14 variables used to create the primary care score. The prevalence of each primary care problem ranged from a low of 8% reporting that they were unable to fill a needed prescription to a high of 45% reporting being unable to receive an appointment in 2 days from their regular source of care. About 8% of respondents had a medical problem but skipped or delayed a needed test. Over a quarter reported considerable difficulty getting care on evenings and weekends and about one-tenth reported that test results or records had not been sent from their usual source of care to a specialist provider. More than a quarter of respondents reported that their usual doctor or source of care only sometimes, rarely or never helped to arrange care from other providers and less than one-fifth reported receiving conflicting information from different doctors. One-tenth of the population reported that a doctor ordered an unnecessary test or repeated a test, and a slightly higher percentage reported that their regular doctor or usual source of care did not know their medical history. In terms of provider characteristics and communication, ~15% of respondents reported that their most recent doctor visit did not last enough time, 13% reported that the doctor did not involve them in making decisions about their care and 10% reported that their doctor did not explain problems sufficiently.

Table 2 presents the distribution of primary care score by country. The mean number of primary care problems ranged from a low in the UK of 1.5 to nearly double that rate (2.96) in the USA. The proportion of the population reporting five or more primary care problems also differed significantly by country. The UK had the lowest proportion (5.5%) whereas the USA reported the highest proportion (24%) with five or more primary care problems. Figure 1 illustrates the population prevalence of reporting no (0) and many (5 or more) primary care problems by country. The figure clearly shows that the USA is the only country where the proportion reporting five or more problems is higher than those reporting no problems. New Zealand had the largest proportion (35%) reporting no primary care problems—about double the US rate of 17%.

Table 3 presents results of multivariable regression analysis estimating the association between the primary care score and indicators of health system performance. The number of primary care problems was positively associated with a greater chance of reporting OOP expenditures. For emergency room use in the past 2 years, people with a greater number of primary care problems were more likely to report such use. Those reporting five or more primary care problems were 2.5 times more likely to report having used the emergency room in the past 2 years than those reporting no primary care problems. Likewise, primary care problems were positively associated with reporting having seen three or more doctors in the past year. There was a negative association between a higher number of primary care problems and reporting having had blood pressure checked. Individuals reporting a greater number of primary care problems were similarly less likely to have had their cholesterol checked in the past year and significantly less likely to have received a flu vaccination. In terms of reporting having experienced errors in medical care, people with a greater number of primary care problems were 6.5 times likely to report having experienced errors in medical care than those with no reported problems.

Table 4 presents the ATEs for each category of primary care problems from the AIPW regression analysis. For reference, in the first column, we present the potential outcome mean (POM) for the control group (no primary care problems). Overall, the relationship between having primary care problems and poorer health system performance and healthcare quality is consistent with results presented in the Poisson models described earlier. The ATE results show a significant gradient whereby greater numbers of primary care problems are consistently associated with greater differences from the control or untreated group (Column 1). As an example, the POM for the control group was 0.12, suggesting that 12% of people with the fewest
primary care problems had OOP expenses of over USD 1000. In comparison, the ATE for this outcome among those with five or more problems was 0.13, suggesting that ~25% (0.12 + 0.13) of people in this category had OOP expenses of over USD 1000. Greater primary care problems were similarly associated with positive ATEs for ER use, having consulted with three or more doctors in 1 year, and reporting having experienced a medical error. ATEs were negative for receipt of blood pressure and cholesterol checks and receipt of flu shots.

**Discussion**

This study has shown that user experiences of primary care are strongly associated with their assessments of overall health system performance and receipt of some types of recommended preventive care. The consistency of this association, the dose–response relationship observed between worse primary care experience and worse outcomes, the magnitude of the association and the consistency between standard and AIPW results all suggest that the primary care measure is capturing important aspects of user experiences and is capable of discriminating among 11 very different national contexts.

The measure presented here provides a complementary perspective on primary care performance and is broadly consistent with other studies using different methods. Kringos et al. recently analyzed the strength of primary care in 27 European countries using ecological-level structural characteristics (governance, financing and workforce) and process data (access, comprehensiveness of care, continuity and coordination) from 2010 [26]. The authors found that the UK and the Netherlands had uniformly strong primary care, whereas France, Germany, Norway, Sweden and Switzerland scored at the mid-level. These rankings (with the exception of Switzerland) are consistent with the results we report here. In countries ranked by previous studies as having strong primary care systems, we find that <10% of the population reported five or more primary care problems. Consistent with prior work suggesting it has among the weakest primary care orientation among wealthy OECD countries, only the USA was found to have over 20% of the population reporting five or more primary care problems [6, 9, 27].

Although it is fair to say that primary care has rarely achieved its full potential, there are several reasons why improving user experiences of primary care could translate into better health system performance and, consequently, better health outcomes [28]. Primary care can play an important role in the provision of advice and support for physical activity, healthy diets and non-smoking norms [29, 30]. Intersectorial actions involving schools, the community and the workplace can also contribute to more effective prevention [31]. At the clinical level, primary prevention includes promotion of regular screening for risk factors, and promotion of child and adult immunizations [32].

Primary care probably plays an even more important role in secondary prevention through the monitoring of risk factors and complications, the provision of individual and group support for behavior change and the promotion of access to and strategies to increase adherence to medications designed to control chronic disease risk factors. Nevertheless, it is important to acknowledge that a number of health reforms designed to improve process measures such as screening rates have not generally translated directly into improved health outcomes [33, 34].

There are several implications of these results. First, measures of primary care experience limited to single components (e.g., coordination of care) or ecological measures of health system performance have not been able to consistently predict health outcomes. Nevertheless, our results suggest that measures of user experiences of primary care can be useful in understanding how primary care might impact health system performance.
structures cannot detect how enhancing one aspect of the health system (such as increasing access to care by employing community health workers) might affect other primary care functions (such as maintaining the longitudinal nature of the doctor–patient relationship). Another advantage of the methods used in this study is that they measure users’ experiences during the past year and do not assume that changes in primary care structure or governance will have immediate effects on access, satisfaction, outcomes or expenditures. While there are important challenges remaining in systematizing how best to translate data on patient experience into better care, multidimensional measures of primary care experiences based on user self-report may hold promise [35].

Second, a number of recent studies, particularly in the USA, have employed a measure of the medical home (defined as those individuals who have a regular provider or place of care, experience no difficulty in accessing this provider, who believe the provider knows about their medical history, and that their regular provider helps to coordinate care) [11]. This binary measure has been shown to be predictive of a number of performance indicators, but it does not allow for identification of a continuum of potential primary care problems [36]. The results shown here demonstrate an important gradient in healthcare performance and quality that may require intervention for distinct subpopulations, based on the number and type of primary care problems they have experienced. Such considerations are particularly important in populations presenting with high levels of comorbidity—a situation becoming increasingly common in many OECD countries [37, 38].

Third, although findings from any cross-sectional observational study should be interpreted with some caution, our results do add supporting evidence to the argument that investing in primary care can be important [27, 31]. In particular, results that associate greater primary care problems with higher use of emergency rooms, lower compliance with blood pressure and cholesterol checks, and fewer flu shots demonstrate the potential of primary care strengthening for improving health system effectiveness overall.

The main limitation of the study is the fact that measures of both outcomes and exposures come from the users themselves. Common method bias could affect results if there are factors driving both the respondent’s assessment of primary care experiences and their assessment of receipt of preventive care or other outcomes. While this bias may be important in cases where unmeasured factors (such as personality or optimism) could affect both assessments of negative primary care experiences and, say, measures of an individual’s overall satisfaction with the health system, it is less likely that such factors would drive respondents to incorrectly report they had their blood pressure checked or that they had consulted with more than three doctors in the past year [39]. Perhaps a more important concern is that self-reports may underestimate the prevalence of major preventive exams and that factors such as educational attainment may be associated with these differences [40]. We account for this potential bias by using the doubly robust AIPW estimator, taking into account educational attainment as both a factor that may influence the likelihood that respondents have poor primary care experiences as well as a

Figure 1 Population prevalence of no (0) and many (five or more) primary care problems, by country.
factor that could influence reporting of receipt of care and other problems. The secondary nature of our data imposed a number of additional restraints. The IHP surveys did not ask about the comprehensiveness of primary care, which means our primary care measure, while robust, is missing a potentially important element. The range of outcome variables was similarly limited as was the ability to design measures of preventive care according to each country’s national screening guidelines. Furthermore, we do not know whether ER use, for example, was for a condition that could have been managed in primary care or for an urgent health need that would appropriately require emergency services. A final limitation stems from the fact that the 2013 IHP survey had lower than expected response rates in Germany and Norway [10]. However, removing two countries from analyses did not significantly affect results presented here (data not shown).

In conclusion, this study has provided evidence that a measure of user experiences of primary care varies among countries is consistent with other approaches to measuring primary care and is strongly associated with people’s assessment of healthcare system performance. Results are expected to contribute to ongoing global efforts to identify appropriate metrics for measuring health system performance and for monitoring, evaluating and enhancing primary care.

Acknowledgments
The authors acknowledge the support of the Inter-American Development Bank. The opinions expressed in the article are the authors’ own and do not necessarily reflect the views of the IDB, its board of directors or the technical advisors. We thank David Squires of the Commonwealth Fund for making data accessible.

References

Table 3 Association between primary care (PC) problems and selected measures of health system performance

<table>
<thead>
<tr>
<th></th>
<th>One PC problem (versus none)</th>
<th>Two PC problems</th>
<th>Three to four PC problems</th>
<th>Five or more PC problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of pocket expenses &gt;USD 1000 in the past year</td>
<td>1.14 (0.7)</td>
<td>1.31*** (0.9)</td>
<td>1.58*** (1.1)</td>
<td>2.04*** (1.4)</td>
</tr>
<tr>
<td>Emergency room use in past 2 years</td>
<td>1.16 (0.1)</td>
<td>1.68*** (1.0)</td>
<td>2.03*** (1.2)</td>
<td>2.51*** (1.4)</td>
</tr>
<tr>
<td>Three or more doctors in past year</td>
<td>1.2 (0.1)</td>
<td>1.2*** (0.9)</td>
<td>1.28*** (1.1)</td>
<td>1.74*** (1.4)</td>
</tr>
<tr>
<td>Blood pressure checked in past year</td>
<td>0.91 (0.1)</td>
<td>1.09 (0.1)</td>
<td>1.17 (0.1)</td>
<td>1.58 (0.2)</td>
</tr>
<tr>
<td>Cholesterol checked in past year</td>
<td>0.92 (0.1)</td>
<td>0.91 (0.1)</td>
<td>0.91 (0.1)</td>
<td>0.87 (0.1)</td>
</tr>
<tr>
<td>Flu shot in past year</td>
<td>0.89 (0.1)</td>
<td>0.97 (0.1)</td>
<td>0.89** (0.1)</td>
<td>0.85** (0.1)</td>
</tr>
<tr>
<td>Report of any medical error</td>
<td>1.36 (0.2)</td>
<td>2.17*** (1.2)</td>
<td>3.8*** (1.5)</td>
<td>6.64*** (1.8)</td>
</tr>
</tbody>
</table>

Note: Numbers represent ATE and robust 95% confidence intervals from augmented inverse-probability weighted regression including age, sex, self-rated health, number of chronic conditions, household income and health insurance. Numbers can be interpreted as the difference in population proportions from the POM of the control group (first column). All differences are statistically significant (*P < 0.05; **P < 0.1; ***P < 0.001).
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Appendix

Figure A1

Figure A1 Overlap Plot.