Living In A Country With A Strong Primary Care System Is Beneficial To People With Chronic Conditions

JOHAN HANSEN[1,*], PETER P. GROENEWEGEN[2], WIENKE G. W. BOERMA[3] AND DIONNE S. KRINGOS[4]

[1] Johan Hansen (j.hansen@nivel.nl) is a postdoctoral senior researcher at the Netherlands Institute for Health Services Research (NIVEL), in Utrecht.
[2] Peter P. Groenewegen is director of NIVEL and a professor of social and geographical aspects of health and health care at Utrecht University.
[3] Wienke G. W. Boerma is a postdoctoral senior researcher at NIVEL.
[4] Dionne S. Kringos is a postdoctoral senior researcher at the Academic Medical Centre of the University of Amsterdam, in the Netherlands, and a 2014–15 Harkness Fellow in Healthcare Policy and Practice at the Harvard T. H. Chan School of Public Health, in Boston, Massachusetts.

ABSTRACT

In light of the growing pressure that multiple chronic diseases place on health care systems, we investigated whether strong primary care was associated with improved health outcomes for the chronically ill. We did this by combining country- and individual-level data for the twenty-seven countries of the European Union, focusing on people's self-rated health status and whether or not they had severe limitations or untreated conditions. We found that people with chronic conditions were more likely to be in good or very good health in countries that had a stronger primary care structure and better coordination of care. People with more than two chronic conditions benefited most: Their self-rated health was higher if they lived in countries with a stronger primary care structure, better continuity of care, and a more comprehensive package of primary care services. In general, while having access to a strong primary care system mattered for people with chronic conditions, the degree to which it mattered differed across specific subgroups (for example, people with primary care–sensitive conditions) and primary care dimensions. Primary care reforms, therefore, should be person centered, addressing the needs of subgroups of patients while also finding a balance between structure and service delivery.

The rising prevalence of chronic disease and multiple morbidities is among the most prominent demand-related challenges faced by health care systems in high-income

countries.[1–3] Disease management programs may improve care for specific groups of patients, but they may also create inequities and fragmented provision of care and may fail to provide the integrated care that patients with multiple conditions need.[4] Internationally, stakeholders have advocated for the strengthening of primary care as a strategy to respond to demographic and financial challenges to health care systems.[5,6] Recently, the strengthening of primary care became one of the key strategies of the new European policy for health,[7] and it is central to the Affordable Care Act in the United States.[8,9] Strong primary care includes a generalist, person-centered approach and a broad range of coordinated services offered to a defined population.[10,11]

Evidence for the benefits of well-developed primary care has grown over the years. Such care is associated with better health outcomes,[11,12] lower costs,[13,14] and improved cost containment.[15] Moreover, when primary care providers are responsible for a defined population, there are improved opportunities for monitoring health, health care use, and quality of care.[16⇓–18]

The available evidence on the importance of strong primary care is growing but not yet conclusive. Therefore, this article is intended to contribute to the literature by exploring whether strong primary care is also related to better health outcomes for patients with chronic and multiple diseases. In particular, do patients with complex needs benefit from strong primary care, which is supposed to be person centered and closely attuned to their needs?[19,20] We focused in part on primary care–sensitive chronic conditions, because management of them in primary care may prevent hospitalization.[21]

We used data that allowed us to measure different dimensions of the strength of primary care, in line with our previously published research on this topic.[12,22] We combined these data with international survey data to analyze individual health outcomes while taking other determinants of health into account, including characteristics of a country's health care system.

We tested the following two hypotheses regarding the relationship between characteristics of a country's primary care system and individuals' health outcomes. First, in countries with stronger primary care systems, people with chronic conditions have better self-rated health, have fewer limitations in activities of daily life, and suffer less often from untreated conditions. And second, these effects are stronger for people with multiple morbidities, primary care–sensitive conditions, or low levels of education.

STUDY DATA AND METHODS

Data

Individual-level data came from the Eurobarometer survey, wave 66.2, which was conducted in 2006 in twenty-nine European countries. The survey was administered through face-to-face interviews among residents ages fifteen and older.[23] To measure the strength of a country's primary care system, we used data gathered in 2009–10 in the thirty-one-country Primary Health Care Activity Monitor for Europe study.[24] This combination allowed us to link country-level information to data on the 26,778 respondents to the Eurobarometer survey who lived in one of the twenty-seven member states of the European Union.

Measurements
We identified individuals as having chronic conditions if they reported that they had or ever had had any of the following thirteen health problems: diabetes; allergies; asthma; hypertension (high blood pressure); long-standing problems with muscles, bones, and joints (rheumatism or arthritis); cancer; cataract; migraines or frequent headaches; chronic bronchitis or emphysema; osteoporosis; stroke or cerebral hemorrhage; peptic ulcer (gastric or duodenal ulcer); and chronic anxiety or depression.
Of all respondents, 59 percent reported having or having had one or more chronic conditions, and we limited the analysis to this group.

Dependent Variables
We measured self-rated health based on how people rated their health in general. The survey options were very good, good, neither good nor bad, bad, very bad, and don't know. Self-rated health is a reliable predictor of mortality and morbidity, and its meaning scarcely differs across social groups,[25]⇓[-27] although some differences have been found between ethnic minorities within a country.[28] We dichotomized answers as good or very good health versus the other options, omitting the twenty "don't know" answers (for sensitivity analyses, see the online Appendix, Section A1).[29]
The second outcome measure was limitations in daily functioning. The relevant question was: "Over the past six months, to what extent, if at all, have you been limited in activities people normally do, because of a health problem?" We dichotomized answers as severely limited versus somewhat limited or not limited at all (for sensitivity analyses, see Appendix Section A1).[29]
For the third outcome measure, having untreated conditions, we used information about whether respondents had undergone long-term medical treatment for any of the thirteen chronic conditions listed above. We dichotomized the answers as yes (having one or more untreated conditions) versus no (treatment was received for all chronic conditions; for sensitivity analyses, see Appendix Section A1).[29]

Primary Care Dimensions
In line with the Primary Health Care Activity Monitor for Europe study, we considered five primary care dimensions: structure (consisting of governance, economic conditions, and workforce development, taken together), accessibility, continuity of care, coordination of care, and comprehensiveness of service delivery. The data on these dimensions came from national and international statistical agencies and country experts.
Indicators in the study had been transformed into scores ranging from 1 (weak) to 3 (strong), which were then combined for each dimension to establish continuous scales. For example, continuity was measured by indicators such as registration of patients with a primary care doctor and the use of electronic clinical records. And to measure comprehensiveness, the researchers looked at the breadth of services offered to patients, such as first-contact care and triage, or of medical technical procedures, such as wedge resection of ingrown toenails or excision of warts. Details on all indicators are presented in Section A2 of the Appendix[29] and elsewhere.[12,22]

Individual-Level Controls
As controls, we added a dummy variable for being female, age in years, and age squared (for nonlinear effects). For these and all following variables, we excluded respondents who left a question unanswered or replied "don't know." We also

excluded people ages twenty-four and younger[30,31] (for sensitivity analyses, see Appendix Section A1).[29] Our analyses were conducted on a sample of 14,131 respondents.

We derived educational level from the question regarding at what age respondents ended their full-time education. In the Eurobarometer data set, answers were originally coded into ranges from "up to age 14" to "age 22 and older." We excluded those who reported that they were "still studying" and combined those who answered "no full-time education" with those who answered "up to age 14." We corrected for across-country differences by using the mean adjusted level per country (that is, a person's educational level minus the average of all respondents in that country).

To assess respondents' position on the labor market, we used a question about current occupation. Answers were grouped into eighteen categories. We excluded respondents who answered "student" and added the other categories as dummies, combining fishermen and farmers. The reference category was "retired or unable to work through illness."

We determined socioeconomic position by means of the possession of certain material goods, such as a television, computer, or car, corrected for the country average.

To investigate interaction effects, we added a dummy variable for multiple morbidities, based on the previously mentioned question about having or having had one or more of the thirteen chronic conditions. The distribution ranged from one to thirteen conditions. Thus, we opted to distinguish between one or two conditions versus three or more conditions. This allowed us to compare people with many chronic conditions to those with only a few (for sensitivity analyses, see Appendix Section A1).[29]

Furthermore, we focused on primary care–sensitive chronic conditions,[32⇓–34] those for which management in primary care might prevent hospitalization. These conditions were diabetes, asthma, chronic bronchitis or emphysema, stroke or cerebral hemorrhage, and hypertension. We thus excluded acute primary care–sensitive conditions, as the role of primary care for such conditions is mostly in primary prevention.

Finally, we corrected for the wealth of a country, as measured by the gross domestic product (GDP)—in purchasing power parity US dollars—per capita in 2009, divided by 1,000 to create effects that were similar in size to those of the other coefficients.

Statistical Analysis

We tested our hypotheses using multilevel analysis, which allowed us to take into account the clustering of individuals within countries. Because all three outcome measures were discrete but correlated, we used a two-level multivariate binary response probit model in which outcome measures were analyzed simultaneously. We fitted multilevel models in MLwiN, version 2.25, using the user-written runmlwin command in Stata, version 13. In the case of positive coefficients, the higher the predictor's score, the higher the predicted probability of the selected health outcome. The Appendix (Sections A3–5) contains both coefficients and standard errors.[29]

In the analyses, we first ran an empty model. Second, we ran a model with all control variables, followed by four models in which we added each country-level primary care variable separately (because of the small number of countries). Third, we tested whether or not the primary care variables had a moderating effect on the relationship

between the three outcomes and multiple morbidities, primary care "sensitiveness"—that is, conditions whose management in primary care might prevent hospitalization—and educational level, again in separate models and using GDP as a country-level control variable. In light of the small number of countries, we used a significance level of 0.10 for our two-sided tests of the hypotheses.

Limitations

Our study had a number of limitations. We used self-reported health outcomes, which may have caused us to under- or overestimate specific outcomes and, hence, the effects of primary care systems on them. However, a selected comparison to national statistics did not provide an indication of such biases (see Appendix Section A3).[29]

In addition, we were able to study only those chronic diseases included in the Eurobarometer survey. The survey did not include every chronic condition, just a number of common ones. As a result, the data would not have allowed us to make clear comparisons between people with versus those without any chronic condition, so we instead focused our analysis only on the former group.

We could also include only one country-level control (GDP) because of the small number of countries. Other relevant variables, such as the availability of hospital services, might compensate for the negative effects of a weak primary care system. A final limitation was that the individual-level data were gathered in 2006, while the country-level data were gathered in 2009–10. We know that the 2006 and 2009 GDPs were highly correlated, and we assumed that primary care dimensions were also relatively stable over time. We do not know of any major primary care reforms in those years. In addition, the use of multiple indicators in the Primary Health Care Activity Monitor for Europe study may have softened any biases.

STUDY RESULTS

About 12 percent of all chronically ill individuals in the study reported having severe limitations, while about half were in good or very good health (Exhibit 1). About one-third had more than two chronic conditions, and almost half had at least one chronic condition for which no treatment was received. For each of the thirteen conditions separately, the share of untreated patients ranged from 4 percent (for both stroke and cancer) to 25 percent (rheumatism) and 28 percent (hypertension; data not shown).

[EXHIBIT 1]

The empty model (Appendix Section A4)[29] provided a baseline for comparisons with more complex models. The empty model showed that of the three outcome variables, self-rated health varied the most at the country level: 5 percent of the variation in self-rated health was a result of variation across countries, while the intraclass correlation was 2 percent for untreated conditions and 1 percent for having severe limitations. Section A5 of the Appendix[29] also contains a model with information on all controls. For example, the wealth of a country was related positively to self-rated health but not related to patients' chances of having severe limitations or untreated conditions.

We analyzed the influence of primary care dimensions on all three health outcomes. Overall, the effects were limited (top panel of Exhibit 2). Continuity and

comprehensiveness were not associated with any outcome measure. Each of the other primary care dimensions were related to one outcome only: Strong primary care structure and good coordination both increased the chance of having good or very good health, while good accessibility helped reduce the risk of having untreated conditions.

[EXHIBIT 2]

Overall, people's subjective health appeared to be better in primary care systems with stronger structures. Subjective health was also the outcome with the highest country-level variation. In contrast, having severe limitations was affected not by any of the primary care dimensions but by other (mostly individual-level) variables.

We also expected that all dimensions of strong primary care would especially affect patients with more than two chronic conditions. In a number of analyses this was indeed the case (middle panel of Exhibit 2). People with multiple morbidities had a higher chance of having good or very good health if they lived in a country with a strong primary care structure, high continuity of care, and a comprehensive primary care system. Of the five primary care dimensions, comprehensiveness was most influential: It affected all three health outcomes for people with multiple morbidities. Apparently, being able to offer a broad set of services is especially beneficial for the health needs of patients with complex health problems.

We expected similar outcomes for people with primary care–sensitive conditions. Indeed, we found that patients with such conditions had fewer limitations in their daily activities if they lived in countries with a strong primary care structure, while living in a country with better continuity helped increase the chance of having good or very good self-rated health (bottom panel of Exhibit 2).

A last question was whether primary care systems with higher scores on all dimensions led to increased equity, but we found very little evidence about this (see Appendix Section A6).[29] Only continuity of care helped reduce the gap in self-rated health between people with more years of education and those with fewer years. Because that could also be the result of chance, this result should not be overemphasized.

DISCUSSION

This study was intended to find out whether the general benefits of strong primary care, demonstrated in previous studies,[6,11,12] also apply to the specific population of patients with chronic conditions. To that end, we combined data on various features of primary care systems with individual-level data about chronically ill people. Indeed, we found evidence that living in a country with a relatively strong primary care system is beneficial to various aspects of people's health. A strong primary care structure and good coordination are important for the self-rated health of people with chronic conditions, while good access to primary care helps them receive care for the conditions they have. To some extent, these dimensions are interrelated, of course. For example, having a strong primary care structure makes it possible to have a sufficient primary care information infrastructure, enough qualified primary care professionals, and supportive primary care policies—all of which are preconditions for primary care access and continuity, coordination, and comprehensiveness of care. Concerning people with multiple morbidities, we found that their self-rated health status was higher in countries with a strong primary care structure, high continuity of

care, and a comprehensive primary care system. The comprehensiveness of services provided was especially beneficial. This may be because having a broad range of services in primary care helps in early diagnosis, treatment, and follow-up care, while also reducing dependence on hospital care.

These effects were much stronger when we defined multiple morbidities as having three or more chronic conditions, and weaker when we defined it as having two or more chronic conditions. Accordingly, strong primary care appears to be especially relevant for people with many chronic conditions, because their health care needs are greatest.

For people with primary care–sensitive chronic conditions, continuity of care appears particularly critical. This indicates the importance of having relationships between patients and primary care providers, managing and communicating health information, and providing case management.

We found no evidence that having a well-developed primary care system reduced inequities in the distribution of care across groups stratified by years of education. This lack of evidence is consistent with previous studies, which showed that in most European countries, access to general practice services as part of primary care is not related to income, whereas specialist care was more accessible for higher-income groups in most European countries.[35,36]

CONCLUSION

No single primary care dimension is beneficial for all chronically ill patients. Thus, a balanced conclusion is justified: Different groups of patients and different types of outcomes benefit from different features of strong primary care. This points to the more general need for primary care to be person centered. Such care takes the needs, possibilities, motivations, and goals of individual patients into account.[36]

It is likely that person-centered care could be delivered more effectively within stronger primary care systems, but this type of care does not develop spontaneously. Reforms and investments in primary care systems therefore must take the diversity of populations into account.

This is an especially relevant policy issue in times of scarcity. In the past couple of years many European countries responded to the financial and economic crisis by a shift to more outpatient care and improved coordination with, or investment in, primary care.[37,38] Similar shifts can be observed in the United States, including various federal initiatives to support states working on primary care transformation, such as the Comprehensive Primary Care initiative.[39,40]

The effects of these programs on patients' health should be monitored by means of follow-up comparative studies using both country- or state-level and individual-level data. Ideally, such studies would also include other relevant outcome measures, such as hospital admissions and emergency department visits, in addition to the self-reported health outcomes used in this study.

NOTES

1. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015;385(9963):117–71.
2. Fortin M, Lapointe L, Hudon C, Vanasse A . Multimorbidity is common to family practice: is it commonly researched? Can Fam Physician. 2005;51:244–5.
3. Starfield B, Kinder K . Multimorbidity and its measurement. Health Policy. 2011;103(1):3–8.
4. Rijken M, Bekkema N, Boeckxstaens P, Schellevis FF, De Maeseneer JM, Groenewegen PP . Chronic disease management programmes: an adequate response to patients' needs? Health Expect. 2014;17(5):608–21.
5. World Health Organization. Primary health care: now more than ever: the world health report 2008 [Internet]. Geneva: WHO; 2008 [cited 2015 Jul 29]. Available from: http://www.who.int.proxy.library.uu.nl/whr/2008/en/
6. Starfield B, Shi L, Macinko J . Contribution of primary care to health systems and health. Milbank Q. 2005;83(3):457–502.
7. Expert Panel on Effective Ways of Investing in Health. Definition of a frame of reference in relation to primary care with a special emphasis on financing systems and referral systems [Internet]. Brussels: European Commission; 2014 [cited 2015 Jul 29]. Available from: http://ec.europa.eu.proxy.library.uu.nl/health/expert_panel/opinions/docs/001_definiti onprimarycare_en.pdf
8. Abrams M, Nuzum R, Mika S, Lawlor G . Realizing health reform's potential: how the Affordable Care Act will strengthen primary care and benefit patients, providers, and payers. New York (NY): Commonwealth Fund; 2011 Jan [cited 2015 Jul 29]. Available from: http://www.commonwealthfund.org/~/media/files/publications/issue-brief/2011/jan/1466_abrams_how_aca_will_strengthen_primary_care_reform_brief_v3.pdf
9. Huang ES, Finegold K . Seven million Americans live in areas where demand for primary care may exceed supply by more than 10 percent. Health Aff (Millwood). 2013;32(3):614–21.
10. Boerma WGW, Fleming DM . The role of general practice in primary health care. London: The Stationery Office; 1998.
11. Starfield B . Primary care: balancing health needs, services, and technology. New York (NY): Oxford University Press; 1998.
12. Kringos DS, Boerma WGW, van der Zee J, Groenewegen P . Europe's strong primary care systems are linked to better population health but also to higher health spending. Health Aff (Millwood). 2013;32(4):686–94.
13. Docteur E, Oxley H . Health-care systems: lessons from the reform experience [Internet]. Paris: Organization for Economic Cooperation and Development; 2003 Dec 5 [cited 2015 Jul 29]. (OECD Health Working Paper). Available from: http://www.oecd.org.proxy.library.uu.nl/els/health-systems/22364122.pdf
14. Gerdtham U, Jönssen B, Macfarlan M, Oxley H . The determinants of health expenditure in the OECD countries: a pooled data analysis. In: Zweifel P, editor. Health, the medical profession, and regulation. Boston (MA): Kluwer Academic Publishers; 1998. p. 113–34.
15. Delnoij D, Van Merode G, Paulus A, Groenewegen P . Does general practitioner gatekeeping curb health care expenditure? J Health Serv Res Policy. 2000;5(1):22–6.
16. Ettner SL . The relationship between continuity of care and the health behaviors of patients: does having a usual physician make a difference? Med Care. 1999;37(6):547–55.
17. Lewandowski S, O'Connor PJ, Solberg LI, Lais T, Hroscikoski M, Sperl-Hillen JM . Increasing primary care physician productivity: a case study. Am J Manag Care. 2006;12(10):573–6.

18. Murray M, Davies M, Boushon B . Panel size: how many patients can one doctor manage? Fam Pract Manag. 2007;14(4):44–51.
19. Making primary care people-centred: a 21st century blueprint. Lancet. 2014; 384(9940):281.
20. Nielsen M, Gibson A, Buelt L, Grundy P, Grumbach K . The patient-centered medical home's impact on cost and quality: annual review of evidence, 2013–2014 [Internet]. Washington (DC): Patient-Centered Primary Care Collaborative; 2015 Jan [cited 2015 Jul 29]. Available for download from: https://www.pcpcc.org/resource/patient-centered-medical-homes-impact-cost-and-quality
21. Caminal J, Starfield B, Sánchez E, Casanova C, Morales M . The role of primary care in preventing ambulatory care sensitive conditions. Eur J Public health. 2004;14(3):246–51.
22. Kringos DS, Boerma WGW, Hutchinson A, Saltman RB , editors. Building primary care in a changing Europe [Internet]. Geneva: World Health Organization; c 2015. (Observatory Studies Series No. 38). Available from: http://www.euro.who.int/__data/assets/pdf_file/0018/271170/BuildingPrimaryCareCh angingEurope.pdf?ua=1
23. European Commission. Eurobarometer 66.2 (Oct-Nov 2006). GESIS Data Archive, Cologne. ZA4527 Data file Version 1.0.1, DOI:10.4232/1.10981 [Internet]. Brussels; TNS Opinion and Social; [cited 2015 Aug 18]. Available from: https://dbk.gesis.org/dbksearch/sdesc2.asp?no=4527&db=e
24. Kringos D, Boerma W, Bourgueil Y, Cartier T, Dedeu T, Hasvold T, et al. The strength of primary care in Europe: an international comparative study. Br J Gen Pract. 2013;63(616):e742–50.
25. Idler EL, Benyamini Y . Self-rated health and mortality: a review of twenty-seven community studies. J Health Soc Behav. 1997;38(1):21–37.
26. Simon JG . How is your health in general? Qualitative and quantitative studies on self-assessed health an[d] socioeconomic differences herein. Thesis [Internet]. Rotterdam: Erasmus University Rotterdam; 2002 Oct 16 [cited 2015 Aug 12]. Available for download from: http://repub.eur.nl/pub/31993/
27. DeSalvo KB, Bloser N, Reynolds K, He J, Muntner P . Mortality prediction with a single general self-rated health question. A meta-analysis. J Gen Intern Med. 2006;21(3):267–75.
28. Agyemang C, Denktaş S, Bruijnzeels M, Foets M . Validity of the single-item question on self-rated health status in first generation Turkish and Moroccans versus native Dutch in the Netherlands. Public Health. 2006;120(6):543–50.
29. To access the Appendix, click on the Appendix link in the box to the right of the article online.
30. Cutler DM, Huang W, Lleras-Muney A . When does education matter? The protective effect of education for cohorts graduating in bad times. Soc Sci Med. 2015;127:63–73.
31. Crimmins EM, Preston SH, Cohen B Pampel F . Divergent patterns of smoking across high-income nations. In: Crimmins EM, Preston SH, Cohen B, editors. International differences in mortality at older ages: dimensions and sources. Washington (DC): National Academies Press; 2010. p. 132–64.
32. Purdy S, Griffin T, Salisbury C, Sharp D . Ambulatory care sensitive conditions: terminology and disease coding need to be more specific to aid policy makers and clinicians. Public Health. 2009;123(2):169–73.
33. Rosano A, Loha CA, Falvo R, van der Zee J, Ricciardi W, Guasticchi G, et al. The relationship between avoidable hospitalization and accessibility to primary care: a systematic review. Eur J Public Health. 2013;23(3):356–60.
34. Van Loenen T, van den Berg MJ, Westert GP, Faber MJ . Organizational aspects of primary care related to avoidable hospitalization: a systematic review. Fam Pract. 2014;31(5):502–16.
35. Van Doorslaer E, Koolman X, Jones AM . Explaining income-related inequalities in doctor utilisation in Europe. Health Econ. 2004;13(7):629–47.

36. Van Doorslaer E, Masseria C, OECD Health Equity Research Group Members . Income-related inequality in the use of medical care in 21 OECD countries [Internet]. Paris: Organization for Economic Cooperation and Development; 2004 May 11 [cited 2015 Jul 29]. (OECD Health Working Paper). Available from: http://www.oecd.org.proxy.library.uu.nl/els/health-systems/31743034.pdf

37. Mladovsky P, Srivastava D, Cylus J, Karanikolos M, Evetovits T, Thomson S, et al. Health policy responses to the financial crisis in Europe [Internet]. Geneva: World Health Organization; c 2012 [cited 2015 Jul 29]. Available from: http://www.euro.who.int/__data/assets/pdf_file/0009/170865/e96643.pdf

38. Thomson S, Figueras J, Evetovits T, Jowett M, Mladovsky P, Maresso A, et al. Economic crisis, health systems and health in Europe: impact and implications for policy [Internet]. Geneva: World Health Organization; c 2014 [cited 2015 Jul 29]. Available from:http://apps.who.int/iris/bitstream/10665/132050/1/Economic%20crisis,%20health%20systems%20and%20health%20in%20Europe%20impact%20and%20implications%20for%20policy.pdf

39. Watkins LD . Aligning payers and practices to transform primary care: a report from the Multi-State Collaborative [Internet]. New York (NY): Milbank Memorial Fund; 2014 Aug 14 [cited 2015 Aug 10]. Available from: http://www.milbank.org/publications/milbank-reports/264-reports-aligning-payers-and-practices-to-transform-primary-care

40. Taylor EF, Dale S, Peikes D, Brown R, Ghosh A, Crosson J, et al. Evaluation of the Comprehensive Primary Care initiative: first annual report [Internet]. Princeton (NJ): Mathematica Policy Research; 2015 Jan [cited 2015 Jul 29]. Available from: http://innovation.cms.gov/Files/reports/CPCI-EvalRpt1.pdf

TABLES
Exhibit 1
Descriptive Statistics For 14,131 Adults Older Than Age Twenty-Four With Chronic Conditions In Twenty-Seven European Countries, 2006–09

Variable	Mean or percent
Has severe limitations	11.9%
Is in good or very good general health	49.2%
Has untreated conditions	48.2%
Female	61.7%
Age (years)	56.1
Age at which full-time education ended (centered)	0.0
Current occupation[a]	
Retired or unable to work because of illness	43.4%
Unemployed or temporarily not working	4.5
Not working or at home	10.2
Farmer or fisherman	1.1
Self-employed professional	1.1
Owner of a shop, craftsman, other self-employed	2.2
Business proprietor, owner of a company	1.6
Employed professional	2.7
General management, director, or top management	1.0

Variable	Mean or percent
Middle management, other management	6.0
Employed position, mainly at a desk	7.3
Employed position, traveling	2.1
Employed position, service job	6.0
Supervisor	0.7
Skilled manual worker	7.0
Unskilled manual worker	3.2
Number of material goods possessed (centered)	0.0
Has more than 2 chronic conditions	33.6%
Has primary care–sensitive condition	55.0%
GDP PPP	$29,702
Primary care dimensions[b]	
Structure	2.24
Accessibility	2.26
Continuity	2.34
Coordination	1.73
Comprehensiveness	2.37

SOURCE Authors' analysis of data from Eurobarometer wave 66.2 (see Note 23 in text) and the Primary Health Care Activity Monitor for Europe study (see Note 24 in text). NOTES The national-level primary care dimensions are explained in Section A2 of the Appendix (see Note 29 in text) and elsewhere (see Notes 12 and 22 in text). GDP PPP is gross domestic product, in purchasing power parity US dollars, divided by 1,000.
[a] Full occupational labels are as follows: retired or unable to work through illness; unemployed or temporarily not working; responsible for ordinary shopping and looking after the home, or without any current occupation, not working; self-employed farmer; self-employed fisherman; self-employed professional (lawyer, medical practitioner, accountant, architect, etc.); owner of a shop, craftsman, other self-employed person; business proprietor; owner (full or partner) of a company; employed professional (employed doctor, lawyer, accountant, architect); general management; director or top management (managing directors, director general, other director); middle management; other management (department head, junior manager, teacher, technician); employed position, not at a desk, but in a service job (hospital, restaurant, police, fireman, etc.); employed position, not at a desk but traveling (salesmen, driver, etc.); supervisor; skilled manual worker; other (unskilled) manual worker; servant.
[b] On a scale of 1 (weak) to 3 (strong).

Exhibit 2

Influence Of Five Primary Care Dimensions On Patients' Having Severe Limitations, Good Or Very Good Health, And Untreated Conditions, And Moderating Effects Of The Dimensions On Patients' Having Multiple Morbidities Or Primary Care–Sensitive Conditions

	Patient has:		
Primary care dimension	Severe limitations	Good or very good health	Untreated conditions
Structure	−0.197	0.860**	−0.548
Accessibility	−0.025	0.283	−0.708*
Continuity	0.747	−0.513	0.883
Coordination	0.155	0.525*	−0.241
Comprehensiveness	0.001	−0.134	−0.245
Dimension multiplied by multiple morbidities (interaction effects)			
Structure	−0.398**	0.300*	−0.145
Accessibility	−0.194	0.168	0.097
Continuity	0.075	0.752*	−0.647
Coordination	−0.151	0.055	−0.068
Comprehensiveness	−0.486**	0.334*	−0.372**
Dimension multiplied by primary care–sensitive condition (interaction effects)			
Structure	−0.350*	−0.101	0.057
Accessibility	−0.072	−0.239	−0.263
Continuity	−0.757	0.945**	−0.360
Coordination	0.031	0.060	−0.104
Comprehensiveness	−0.122	0.253	−0.047

SOURCE Authors' analysis of data from Eurobarometer (see Note 23 in text) and the Primary Health Care Activity Monitor for Europe study (see Note 24 in text). NOTES The exhibit shows probit regression coefficients for separate two-level models, all of which included individual-level confounders and country-level gross domestic product. For example, when the level of coordination is higher, the probability of chronically ill being in good or very good health is also higher. Two-sided tests were used, implying that both positive and negative values are considered significant.
 * P<0.01
 ** P<0.05