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health care in California: leveling the playing field

November 2013

LANGER RESEARCH ASSOCIATES
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introduction

In California, there are significant efforts underway to expand access to health care in underserved and hard-to-reach regions. Despite our best efforts, we continue to observe longstanding variations in our population's wellbeing. And while wealth does not guarantee health, there is ample evidence that high-income individuals have more access to care and better health outcomes than their lower-income counterparts. In areas of the state with high uninsured and poverty rates, we see troubling quality-of-life statistics and greater prevalence of chronic disease.

These profound inequities are disturbing, and must serve as motivation for developing new solutions to help us level the healthcare playing field. That is why I am so excited to share Blue Shield of California Foundation's latest report, based on new research led by Langer Research Associates. The report's findings offer unique insight into the patient experience across income levels, and provide policymakers, stakeholders, and providers with clear and actionable recommendations to rebalance our healthcare system.

As the report reveals, the nature of care that patients receive can explain vast differences in the healthcare experiences of low and higher income Californians. Until recently, we have assumed many factors were inevitable and immutable as a result of structural poverty. This research challenges that notion and initiates a new conversation around improving our healthcare system for those most in need.

Building from our previous surveys of low-income Californians, this research broadens the scope of understanding about healthcare disparities, and pushes the entire system toward a new paradigm in which everyone – no matter their income or location – has access to high-quality, affordable care. I hope you'll join me in sharing these important findings with others in the field as we address the challenges and opportunities that lie ahead.

Thank you to Langer Research Associates for making this series of reports possible.

In partnership,

Peter Long, Ph.D
President & CEO
Blue Shield of California Foundation

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executive summary

A vast gap divides low- and higher-income Californians in their healthcare experiences. Those with low incomes have weaker care relationships, less information, greater health challenges and lower satisfaction with the care they receive. It looks like a tale of two worlds of health care in California – one for the better-off, another for the poor.

But it doesn't have to be. While income illustrates the problem, its chief cause lies elsewhere.

While income illustrates the problem, its chief cause lies elsewhere – in the nature of the care that patients receive.

This statewide survey sponsored by Blue Shield of California Foundation takes on the long-vexing problem of income inequality in health care, reaching for solutions by identifying the factors that underpin the issue. The research finds that the nature of the care that patients receive – rather than their income levels – explains most of the difference in healthcare experiences between low- and higher-income Californians. As such, the results not only demonstrate the gap that exists, but point to practical, achievable measures to address it.

Echoing earlier Foundation-sponsored studies, the survey finds that the challenge is rooted in the quality of caregiving relationships. That includes patient-provider rapport, the extent to which patients feel connected with their care facility, the continuity of their care, the encouragement they're given to take an active role, their use of health information technology, their confidence in their decision-making ability and how informed they feel about their health.

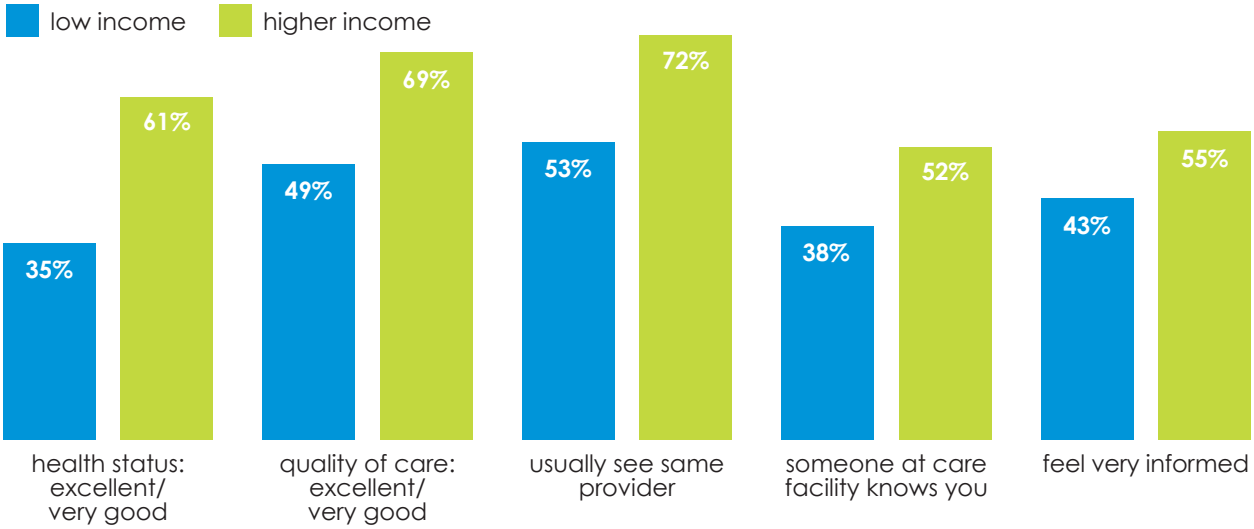
Though the current income gap in these aspects of care may stem from disparities in funding for facilities that serve low-income populations, results from this survey suggest that closing that gap need not necessarily require higher spending. Instead, many of the discrepancies can be influenced by creative solutions that may not require added costs. These include emerging approaches such as team-based care, the use of healthcare navigators and the increased use of communication technology to enhance patients' information access and connection with their care providers and facilities.

Simply training providers to communicate better with their patients and encourage them to become more involved in their own care also can have a profound effect. Moreover, providing patients with information resources – for example a decision aid or a vetted website, video or pamphlet – has the potential for substantial benefits. Whatever the method, as the key elements of caregiving relationships improve, the gap in healthcare experiences between low- and higher-income Californians fades.

Clearly, improvement efforts are sorely needed – because as things stand, the differences are substantial, and in some cases dramatic. Among them:

- At the most basic, just 35 percent of low-income Californians report their current health status positively (that is, as either "excellent" or "very good"). That soars vastly higher, to 61 percent, among higher-income Californians.

- Only 49 percent of low-income Californians rate the quality of their care positively – vs. 69 percent of their higher-income counterparts. Notably, this difference is impacted only slightly by the lower health status of lower-income Californians; the key predictors, as detailed below, relate much more strongly to their experience of their care.



- Compared with higher-income Californians, those with low incomes are 19 percentage points less apt to report continuity in their care (i.e., that they usually see the same provider on each visit), 53 vs. 72 percent, and 14 points less apt to say someone at their care facility knows them pretty well (i.e., connectedness), 38 vs. 52 percent. As shown in a 2012 Foundation study, continuity and connectedness are key predictors of patient empowerment and efficacy.

- Information also is central to engaged, efficacious patients, and low-income Californians are 12 points less apt than higher-income residents to feel very informed about their health, 43 percent vs. 55 percent.

- Low-income residents score 9 to 13 points lower than higher-income Californians on a range of questions evaluating their relationship with their providers, such as feeling they have a great deal of say in decisions about their care, being very comfortable asking questions, feeling welcome to

share outside information with providers and being asked by providers if they have questions or concerns. The low-income also are significantly less trusting than their higher-income counterparts in information from providers and healthcare staff, a skepticism that needs to be addressed.

- As noted in a previous report from this survey, there's a broad digital divide, with low-income Californians 29 points less apt personally to have internet access, 58 vs. 87 percent, and 30 points less likely to have a smartphone, 39 vs. 69 percent. (The gap on having a text-capable cell phone is far smaller, 11 points, 80 vs. 91 percent.)

- That divide, however, is not the only source of communication differences. Comparing only low- and higher-income Californians who have internet access, low-income patients are a broad 18 points less likely to say they receive e-mails from healthcare providers or staff (22 vs. 40 percent) and 13 points less apt to say they can e-mail questions to those care professionals (32 vs. 45 percent). Low-income Californians overall also are less apt to say their facilities offer a "patient portal" website, 29 vs. 40 percent. The digital divide thus is compounded by the fact that even when low-income Californians do have internet access, their healthcare facilities are less likely to accommodate it.

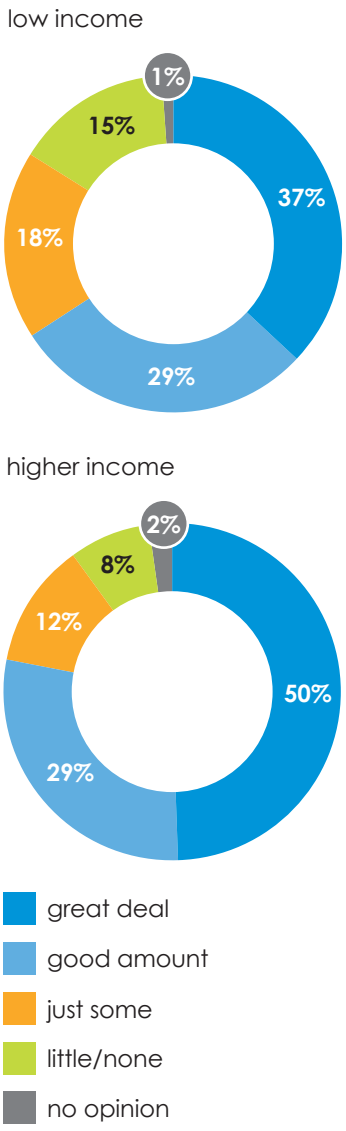
demographic differences

There are notable demographic differences as well. Compared with higher-income Californians, those with low incomes were, at the time of the interview, 48 points less likely to have private health insurance, 26 points more apt to have government-provided insurance and 20 points more likely to lack insurance entirely. Low-income patients also are far less likely than those with higher incomes to be working full-time, and are less educated, less likely to be white or to speak English at home, younger and less apt to be married.

Despite the difference in their health ratings, the two income groups are not significantly different in how often they've had a medical appointment in the past year – an average of 4.8 times in the low-income group and a similar 4.4 times in the higher-income group. Since lower-income patients are much less apt to rate their health positively, this suggests that many may have significant health care needs that currently are unmet.

There's also a sharp difference in the type of care facilities used. Three-quarters of higher-income Californians report going either to private doctors' offices or Kaiser Permanente for their care. That falls to fewer than half as many low-income Californians, 33 percent; they're far more apt to rely on community health centers or, for 9 percent, emergency room care.

amount of say you have in decisions about your care



strategies to level the playing field

Neither low-income Californians, nor facilities that specialize in providing their care, need to be resigned to the status quo. The gap, in fact, can be bridged: Statistical modeling finds factors that largely eliminate the difference in care experiences between higher- and low-income Californians. Though perhaps not an easy task, these results suggest clear avenues for progress. Among them:

The gap between income groups will be reduced to the extent safety net facilities can improve patient-provider rapport and inspire trust in the information caregivers provide.

- Satisfaction with care is influenced strongly by the quality of patient-provider relationships and the extent to which patients trust the information they receive from their care providers and other medical staff. The gap between income groups in healthcare experiences is likely to be reduced to the extent safety net facilities can improve patient-provider rapport and inspire trust in the information caregivers provide. Increasing continuity and connectedness (either through traditional or alternative means) are two pathways to improving patient-provider bonds and inspiring such trust.

- Use of health technology is another factor that reduces the gap in care experiences between higher and lower income Californians – in particular, sending and receiving e-mails and text messages to and from providers. Efforts to open these communication channels should help address the discrepancy between low-and high-income patients in their satisfaction with their care.

- Connectedness, continuity and feeling informed also significantly decrease the relationship between income and quality-of-care ratings. (Connectedness refers to the extent to which patients say someone at their care facility knows them; continuity, the extent to which they see the

same caregivers over time.) Previous research shows that each of these can be addressed creatively with innovations such as team-based care and the use of healthcare navigators, without draining scarce resources such as doctors' time. To the extent that safety net facilities implement such changes, again the satisfaction gap should ease.

These factors do not entirely erase the role of income in predicting patients' satisfaction with their care. But the predictive power of income drops by half when these other factors are taken into account, a major step on the road to more equitable care for low-income Californians in comparison with their higher-income counterparts.

Other models show even stronger effects in attenuating the role of income in healthcare experiences. In evaluating patients' information levels, income shrinks to irrelevance once six other elements are added to the equation – the quality of patient-provider relationships, patients' primary language, trust in information from medical sources, use of technology for health information, connectedness and continuity.

In terms of predicting positive patient-provider relationships, controlling for five variables also renders income entirely non-significant: connectedness, continuity, the patient's preferred language, use of health information technology and the level to which the patient feels informed about her or his health. In other words, the income gap in patient provider relationships is entirely explained by low-income Californians' disadvantage on each of these five factors compared with higher-income Californians. By identifying the basic components that underlie the income gap, it becomes a far less onerous task to close it.

Indeed, the previous report from this study laid out promising methods by which each of these key predictors of patient engagement, efficacy and satisfaction can be improved, often with methods that require little to no added resources. This report finds that by taking those steps, safety net healthcare facilities have it within their power to move low-income patients to parity with their higher-income counterparts in the key areas of health information, patient-provider relationships and patients' satisfaction with the quality of their care.

Safety net healthcare facilities have it within their power to move low-income patients to parity with their higher-income counterparts.

project overview

This Blue Shield of California Foundation survey extends research initiated by the Foundation in 2011 to study the healthcare experiences and preferences of low-income Californians, identify the motivators of patient satisfaction and engagement, explore receptiveness to alternative care models and uncover the factors that best inform successful patient-provider relationships.

BSCF commissioned this research to better inform public policy and the implementation of the Patient Protection and Affordable Care Act (ACA). Specifically, two aims have motivated this project: First, to help healthcare facilities – particularly California's community health centers – successfully navigate the changes brought about by the ACA; second, to help identify the most effective ways of encouraging low-income patients and providers alike to embrace primary care redesign and ultimately move closer toward the goal of patient empowerment, as envisioned in the principles of patient-centered care and shared decision making.

The research produced *On the Cusp of Change: The Healthcare Preferences of Low-Income Californians* in 2011, followed by a pair of reports in 2012, *Connectedness and Continuity: Patient-Provider Relationships among Low-Income Californians* and *Empowerment and Engagement among Low-Income Californians: Enhancing Patient-Centered Care*. Most recently, in October 2013, the Foundation published *Building Better Healthcare for Low-Income Californians*, a first report from the 2013 survey focusing on the role of information and communication in low-income Californians' relationships with their providers and their interest in alternative care and communication strategies.[1]

This report turns to an assessment of the differences in healthcare as experienced by low- and higher-income Californians, and, through statistical modeling, an evaluation of the factors that mitigate those differences. In an expansion upon the previous studies, higher-income Californians were added to this year's sample to accomplish this comparison. The aim, rather than simply to chronicle the differences between income groups, is to identify promising approaches safety net providers can use to address them.

As in past years, sampling, field work and data tabulation for the survey were carried out by SSRS/Social Science Research Solutions of Media, Pa. Interviews were conducted in English and Spanish on landline and cellular telephones from May 2 to June 8, 2013, among 1,018 Californians with household family incomes below 200 percent of the federal poverty level (FPL) and 498 with incomes at 200 percent of the FPL or more. The margin of sampling error is plus or minus 3.5 percentage points for the sample of low-income respondents and 5 points for the higher-income sample, accounting for design effects.[2]

The study was produced and analyzed by Langer Research Associates of New York, N.Y., after an extensive review of the relevant literature as well as discussions with a group of prominent researchers and practitioners in the field. They include Rushika Fernandopulle, M.D., co-founder and CEO of Iora Health; Dominick Frosch, Ph.D., Professor of Medicine, University of California at Los Angeles and Associate Staff Scientist at the Palo Alto Medical Foundation's Research Institute; Boris Kalanj, Director of Programs at the California Health Center Safety Net Institute at the California Association of Public Hospitals and Health Systems; Sunita Mutha, M.D., Professor of Medicine, University of California at San Francisco (UCSF) and Director of the Center for the Health Professions; Ed O'Neil, M.P.A., Ph.D., F.A.A.N., Professor, Family and Community Medicine, USCF, and former Director of the Center for the Health Professions; Lyn Paget, M.P.H., Director of Policy and Outreach at the Foundation for Informed Decision Making; David Quackenbush, former Vice President of Member Services and Val Sheehan, M.P.H., Director of Development and External Relations at the California Primary Care Association; Ron Spingarn, Deputy Director of the California Office of Statewide Health Planning and Development; and Jane Stafford and Veenu Aulakh, M.S.P.H., Managing and Associate Directors of the Center for Care Innovations. We are grateful for their insights.

Blue Shield of California Foundation (BSCF), long a thought leader in safety net healthcare services, has sponsored this research as part of its mission to improve the lives of Californians, particularly underserved populations, by making health care accessible, effective and affordable for all Californians. BSCF in particular has a history of support for the state's community health centers through its Community Health Center Core Support Initiative and Clinic Leadership Institute offerings.

This research was directed by Gary Langer, president, and Julie E. Phelan, Ph.D., senior research analyst, of Langer Research Associates, with the assistance of Gregory Holyk, Ph.D., and Damla Ergun, Ph.D., research analysts. Data analysis was conducted by Phelan, and Langer and Phelan wrote the report. All comparisons of data have been tested for statistical significance. Langer Research Associates complies with the Code of Professional Ethics and Practices of the American Association for Public Opinion Research and the Principles of Disclosure of the National Council on Public Polls.

Questions on any aspect of the this study, and requests for further data analysis, should be directed to Crispin Delgado, Blue Shield of California Foundation, 50 Beale Street, 14th Floor, San Francisco, Calif., 94105-1819.

endnotes

1 See the "Building Better Healthcare" report for four appendices that are not duplicated in this second report in the series: the literature review conducted for this study (Appendix A), a detailed description of the survey methodology (Appendix C), the full formatted survey questionnaire (Appendix E) and a list of references (Appendix F).

2 See Appendix A of this report for a topline data report and Appendix B for details of statistical modeling.

part a: population profiles

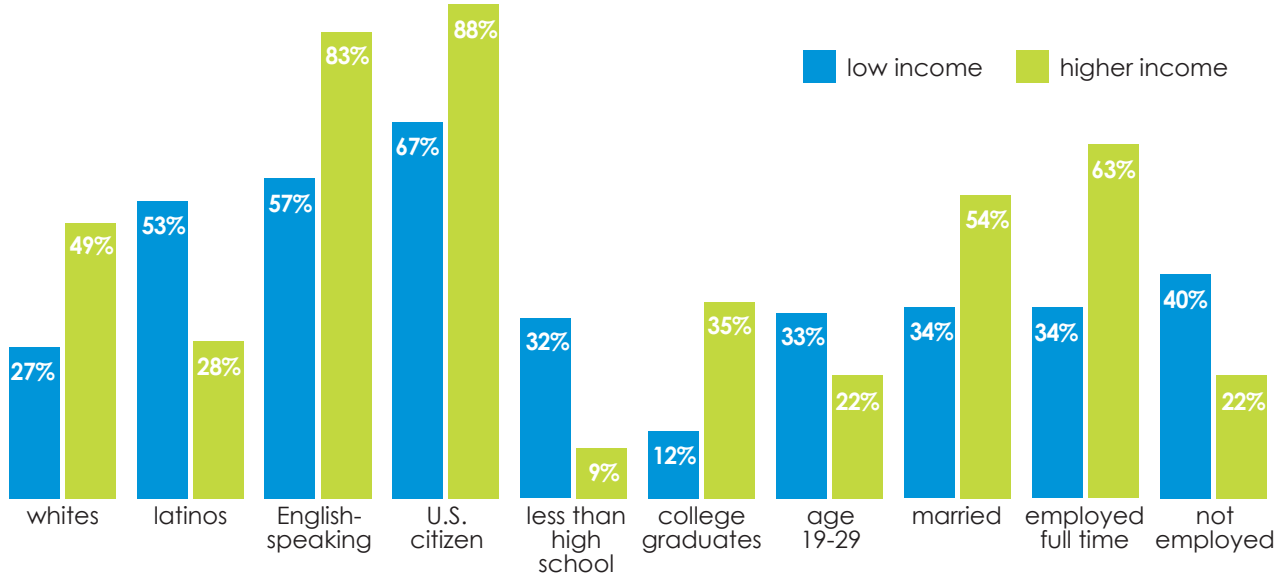
section i: demographic differences

Community health centers can leverage their traditional focus on cultural competence and multilingualism.

One of the largest differences that currently exists between low- and higher-income Californians is likely to change dramatically as the ACA takes full effect.[3] Eighty-one percent of higher-income respondents report having private health insurance – in nearly 90 percent of those cases, provided by an employer. But just 33 percent of low-income Californians had private insurance at the time this survey was conducted. About as many, 35 percent, had government-subsidized insurance (chiefly Medi-Cal), compared with just 9 percent of higher-income respondents. And 30 percent in the low-income group lacked any health insurance, vs. 10 percent of those with higher incomes.

Changes in these numbers will be fascinating to watch as the ACA comes into its own. It's the certainty of that change that motivates this research; it is expected that millions of low-income patients will move to insured status, and many will have greater flexibility in their choice of where they go for care. A key question is how traditional safety net providers can best adapt.

Other differences in low- vs. higher-income population profiles suggest some advantages for community health centers in retaining their clientele. Many such centers traditionally have focused on cultural competence and multilingualism – positioning they can continue to leverage, given its fit with the low-income population. Just 27 percent of low-income Californians are



non-Latino whites; 53 percent are Latinos. Among higher-income residents the numbers are almost reversed: Forty-nine percent are white, 28 percent Latino. Further, 83 percent in the higher-income group chiefly speak English at home, vs. just 57 percent of low-income Californians. And 88 percent in the higher-income population identify themselves as citizens, vs. 67 percent in the low-income group.

In terms of education, just 12 percent of low-income Californians are college graduates, vs. 37 percent of their higher-income counterparts; indeed 32 percent in the low-income group lack a high school diploma, compared with just 9 percent in the higher-income group. But low-income Californians are just as hungry for health information, as explored elsewhere in this report. Nonetheless, their comparatively lower educational levels should inform efforts to make that information clear and accessible.

Among other demographic differences, a third of low-income Californians are younger than age 30, compared with 22 percent of those in the higher-income category. Those in the low-income group are a wide 20 points less apt to be married, 34 vs. 54 percent. And as befits their income and pre-ACA insurance status alike, just 34 percent in the low-income group are employed full time, while 40 percent are not employed. The comparable numbers among higher-income Californians are 63 percent employed full-time and 22 percent not employed. ("Not employed" incudes all those not working for pay, including the unemployed, homemakers, retirees, students and the disabled.)

Regarding the usual source of care for these groups, nearly half of low-income Californians, 48 percent, report using some type of clinic (this includes public, private, hospital and community clinics) while an additional 9 percent get their care from hospital emergency rooms. Just a third use either private doctors' offices (25 percent) or Kaiser Permanente (9 percent). Among higher-income patients, by contrast, 50 percent report using private doctors, 24 percent Kaiser Permanente; just 17 percent go to clinics and a negligible 3 percent rely on emergency rooms for their care.

section ii: health status

Self-reported health status constitutes one of the most notable differences between the low- and higher-income populations. Those with higher incomes are 26 points more likely to rate their own health as excellent or very good, 61 vs. 35 percent; they're twice as likely to say it's excellent, 24 vs. 12 percent. Low-income Californians, by contrast, are far more apt to rate their health as fair or poor, 31 vs. 13 percent.

There are differences within the low-income population; health ratings are higher, for example, among those with higher (albeit still low) incomes, with more education and with private insurance, as well as among whites, English speakers and younger adults. But even these better-off low-income groups lag the higher-income population overall, by wide margins.

Health ratings are higher among low-income Californians who feel connected with their facility (41 percent rate their health positively, vs. 32 percent who lack a personal connection), who feel they're given the amount of say in their care that they desire (42 percent, vs. 29 percent among those who want more say) and who feel very informed about their care (44 percent rate their health positively, vs. 23 percent of those don't feel informed). It's unclear whether being connected, engaged and informed helps improve patients' health, or whether healthier patients being more apt to feel connected, engaged and informed, but clearly these factors are intertwined.

Health ratings are higher among low-income Californians who feel connected with their provider.

Further, even as low-income Californians are far more apt to report health problems, there's essentially no difference in how often they seek medical treatment. Nineteen percent in the low-income group had no medical visits in the previous 12 months, as did 15 percent in the higher-income group. The average number of visits also is not statistically different, 4.8 vs. 4.4. The fact that more lower-income Californians report being in ill health, but do not report more medical visits, suggests that this population may have substantial unmet healthcare needs.

section iii: health information

Feeling informed about one's health is a gateway for patients to engage actively in their care, a key goal of the patient-centered care movement. And at first sight, self-reported information levels are high – 93 percent of higher-income Californians report feeling very or somewhat informed about their health, as do 82 percent in the low-income population.

But substantially fewer in either group feel "very" informed, the optimum information level – 55 percent of higher-income patients and 43 percent of low-income Californians. Those results indicate that both groups could benefit from a concerted effort to increase the accessibility of health information, but that this is especially true among lower-income Californians.

Differences among groups within the low-income population mark ways the information gap between low and higher-income Californians may be addressed. For example:

- Among low-income patients with continuity in their healthcare – meaning those who see the same provider on all or most visits – 54 percent feel very informed about their health. Among those who rarely or never see the same provider, just 33 percent feel very informed.

- Connectedness also matters: Among low-income Californians who say someone at their care facility knows them pretty well, 59 percent feel very informed. Among those without that personal link, this declines to 34 percent.

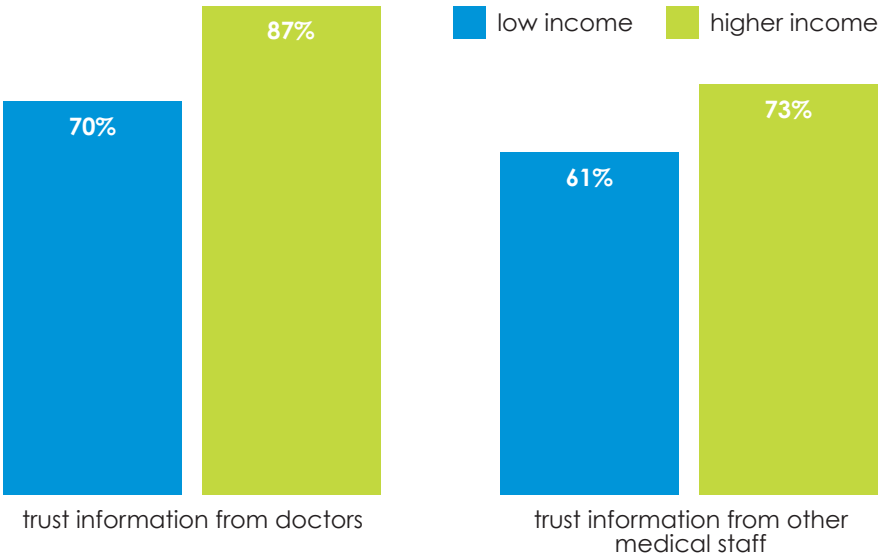
- The patient-provider relationship is also central: Among low-income patients who think their provider cares a great deal about them personally, 71 percent also feel very informed about their health; it's 27 percent among those who don't think their provider cares much

Among patients who think their provider cares a great deal about them personally, 90 percent feel informed about their health. Among those who don't think their provider cares much about them, it's 64 percent.

about them. Patients also are 32, 29 and 28 points more apt to feel very informed, respectively, when they feel their provider often explains things well, asks them if they have questions and encourages them to take an active role in their care.

- Low-income patients are 19 points more likely to feel very informed when their provider is the primary source of health information, compared with those who rely chiefly on other information sources. A challenge in this regard is that, compared with higher-income Californians, low-income patients are 17 points less likely to trust information from the doctors they see, and 12 points less likely to trust information from nurses or other medical staff.

- Moving forward, this gap in trust will be important for safety net providers to address in order to succeed in the ACA-inspired future. Previous BSCF survey results suggest that such steps may include training providers to communicate better with their patients –e.g., explaining things clearly, including to non-English speakers, and encouraging questions. Helping patients become more savvy consumers of health information also may help. Finally, increasing continuity and connectedness and encouraging patients to be actively engaged in their care also are promising avenues for helping to close the current trust gap.



- Language is another central factor; low-income Californians who speak English at home are 20 points more likely to feel very informed about their health than are those who primarily speak another language. Related to the point directly above, low-income English-speakers also are 17 points more apt than non-English speakers to trust information from doctors. Enhanced linguistic competence in care facilities may simultaneously help boost both patients' information levels and their trust in medical staff as information providers.

These results are borne out in regression modeling, a statistical technique that assesses the independent relationship between an outcome (in this case, information) and individual variables that might predict it. In these models, in and of itself, income is a strong predictor of patients' information levels. But income is eliminated as a statistically significant predictor of information by adding other factors as control variables: patient-provider rapport, patients' primary language, trust in medical sources of information, use of health information technology, connectedness and continuity.[4]

It should be noted that while low-income Californians' self-reported information levels are lower, it's not for lack of interest: They are no less apt than their higher-income counterparts to say they'd like more information to help them make informed medical decisions. Indeed, they're 7 points more likely to want "a lot" more information, indicating awareness of the information deficit that exists. Further, low-income Californians are no less apt than those in the higher-income group to express interest in a variety of technology-based health-related tools and information sources, including websites, applications, e-mail, texting and automated notifications.

At the same time, low-income Californians are 16 points less likely than those with higher incomes to want a great deal of say in their care, likely reflecting a variety of factors – linguistic, socioeconomic and cultural alike. Further, those with internet access are 14 points less likely than their higher-income counterparts to have used the internet to access health or wellness websites. The low-income population overall is 11 points less apt than those with higher incomes to find searching for health information very helpful, and 9 points more likely to find the process overwhelming. So while they want and need additional health information, the low-income population also should benefit from thoughtful support in obtaining and using it.

endnotes

3 Throughout this report, low-income refers to respondents below 200 percent of the federal poverty level (an annual income of about $47,000 for a family of four), while higher-income refers to respondents at or above 200 percent of the federal poverty level.

4 Adding the variables mentioned here to a linear regression, the beta for income as a predictor of information drops from .14 to .01. Connectedness also becomes non-significant. See Appendix B.

part b: experience of care

section iv: quality of care

Patients are hard to please: Even among higher-income Californians, just 40 percent rate the quality of the health care they receive as "excellent," the top choice on a five-item scale. But that drops to 26 percent among low-income patients. Combining "excellent" and "very good" ratings, it's 69 percent among higher-income patients, 49 percent among those with lower incomes – indicating very sharp differences in quality-of-care experiences.

As with information, however, there are differences within the low-income population that suggest solutions to the quality-of-care drop-off between income groups. They include the following:

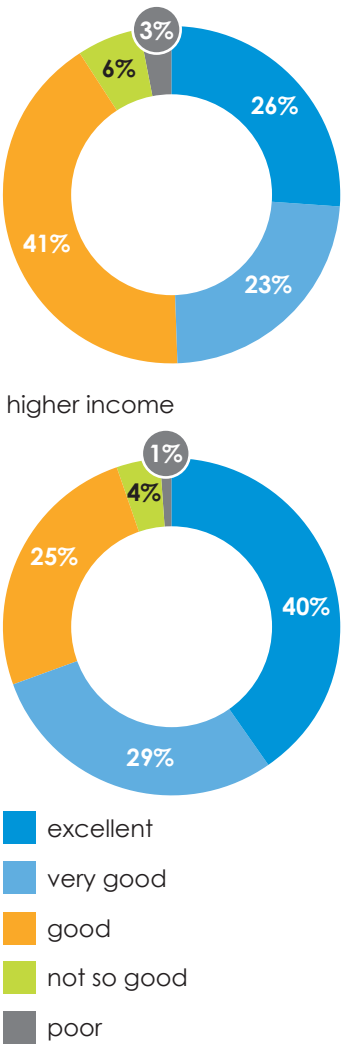
- Satisfaction with care is substantially higher among low-income Californians who can communicate with their provider via e-mail or text messages. For example, among those who say they receive text-messages or e-mails from their care provider, satisfaction ratings soar to 70 and 68 percent, respectively – equaling the satisfaction of higher-income respondents overall. Moreover, 69 percent of those who say they can get answers to their questions via e-mail rate their care positively, as do 62 percent of those who say they can get an answer to questions via text.

- Among low-income patients who think their provider cares a great deal about them, 68 percent rate their quality of care positively – as high as its rating among higher-income Californians. Among those who see no personal concern, that plummets to 28 percent.

- Among low-income Californians who feel that someone at their facility knows them well 64 percent rate their care positively, very near the high-income population score. That compares with 40 percent among those who lack this sense of connection.

- Positive quality-of-care ratings are 15 points higher among low-income patients who report continuity in their care (again, seeing the same provider over time) than among those who don't, 56 percent vs. 41 percent. But that still leaves a 13-point gap in quality of care ratings between low-income Californians with continuity in their care versus higher-income patients overall, suggesting that continuity is just a part of the picture.

quality of care ratings



Income is markedly reduced as an indicator of quality-of-care ratings when strong patient-provider relationships and trust in doctors or other medical providers are present.

- Quality-of-care ratings are substantially higher among low-income patients who have more information and who have strong patient-provider rapport, e.g., those who say their provider explains things clearly, invites their questions and encourages them to take an active role in their care. This indicates the power of the patient-provider relationship in decreasing the income gap in satisfaction.

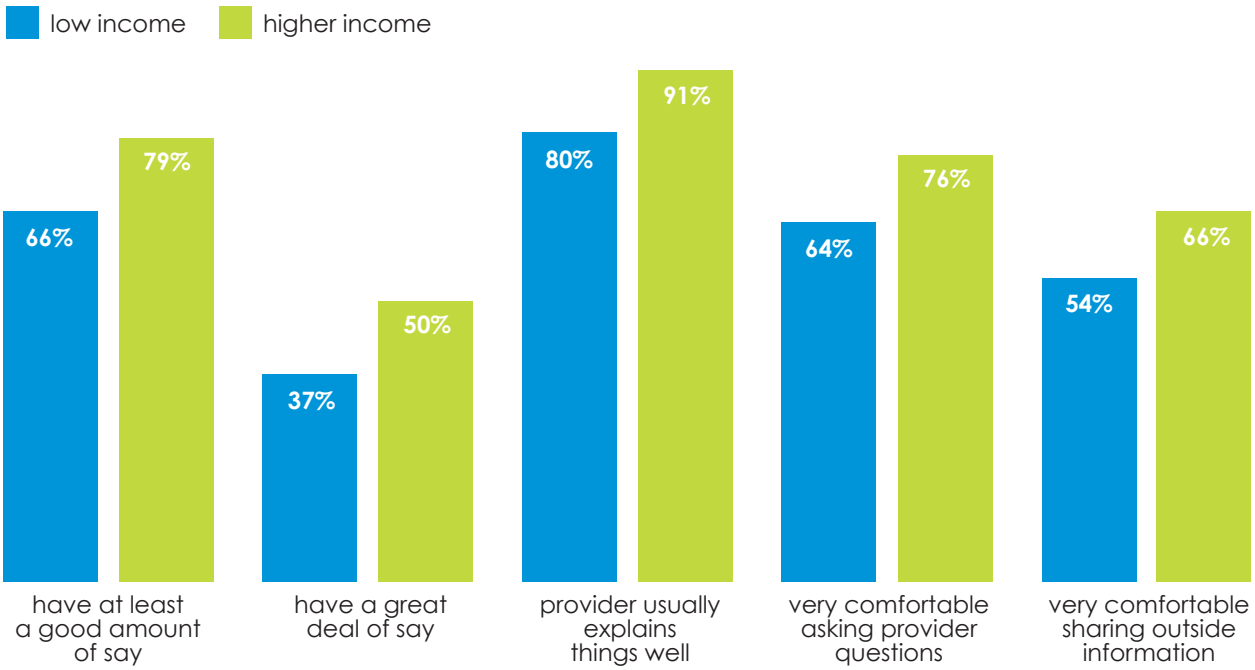
Each of these can be buttressed. Connectedness, for example, is notably higher among low-income patients who have access to a patient portal website. It's also much higher among those who speak English, again suggesting the need for greater linguistic capability. Continuity is higher among English speakers, but also among low-income patients who are enrolled in team care programs and those who have a health coach.[5]

Again we conducted statistical analyses to predict what factors can help reduce the difference between low- and higher-income groups' ratings of the quality of the health care they receive. These models show that income is markedly reduced as an indicator of care quality ratings when strong patient-provider relationships and trust in doctors or other medical providers are added to the mix. The use of health technology also diminishes the income gap, especially the ability to communicate with care providers via text messages or e-mail. So do connectedness, continuity and feeling informed. When all these are present, the power of income to predict quality-of-care ratings, while still statistically significant, is diminished by nearly 60 percent.[6]

section v: patient-provider relationships

As established in this and previous survey reports, patient-provider relationships are a crucial factor in patients' information levels and satisfaction with their care, as well as their empowerment and engagement. And individual measures of the relationship between patients and their providers are consistently higher, by 9- to 13-point margins, among higher-income Californians compared with those with low incomes.

In one such gap, 79 percent of higher-income patients feel as if they have at least a good amount of say in decisions about their care; that drops to 66 percent of low-income Californians. And the number who feel they have a "great deal" of say declines, similarly, from 50 percent in the former group to 37 percent in the latter.



Among other items, 91 percent of higher-income patients say their provider usually explains things in a way they can understand, 76 percent feel very comfortable asking their provider questions and 66 percent feel very comfortable sharing outside health information with their provider. The corresponding numbers among low-income patients are 11, 12 and 12 points lower, respectively.

These and other related measures were combined into an index of patient-provider relationships. Specifically, this index includes questions assessing the following:

- The extent to which patients feel their provider cares about them personally;
- The frequency with which patients feel their providers explain things to them in a way they can understand and ask them if they have any questions or concerns;
- How comfortable or uncomfortable patients feel asking providers questions, telling providers about health information they've obtained from outside sources and telling providers when they disagree with their recommendations;
- How simple or complicated patients feel the health information they've received from their providers in the past has been; and
- How much of a say patients feel they currently have in decisions about their health care.

Overall, higher-income patients score higher than lower-income ones by a statistically significant margin.[7] Again, however, further analysis finds factors that weaken the impact of income on positive patient-provider relationships. Specifically, when connectedness, continuity, the patient's primary language, use of health technology tools (especially e-mail and text messaging with providers) and information levels are included in the model, the income gap in patient-provider relationships becomes non-significant.[8]

We further explored the gap in ratings of patient-provider relationships by comparing low-income patients whose average score on the patient-provider index matches that of high-income Californians with those who fall short. The key differences echo many of those discussed above:

- Having team-based care, a healthcare coach and, to a lesser extent, having used a decision aid all differentiate low-income Californians who score more strongly in patient-provider rapport vs. those who score more weakly.
- Patient-provider relationships also are more positive among lower-income patients who experience connectedness with their facility, continuity and a feeling that they have at least a good amount of say in their care, as well as, naturally, those who give positive ratings to the quality of their care.
- Attitudinally, the patient-provider index improves among low-income patients who feel very confident in their decision-making ability, feel informed about their health, are satisfied that they have the information they need to make health care decisions, trust in information from medical sources and have the level of say they desire.

comparison by patient-provider index (PPI) score

	higher income	low income, high PPI	low income, low PPI
Feel informed about your health	93%	87%	55%
Feel very informed	55%	49%	10%
Rate your health care positively	69%	53%	21%
Very confident in your decision making	68%	65%	39%
Have as much say in decisions as you want	61%	53%	28%
Someone at your care facility knows you well (connectedness)	52%	42%	12%
Have all the information you need to make decisions	49%	46%	21%
Have a patient portal	40%	31%	14%
Have team-based care	24%	36%	12%
Have a healthcare navigator	15%	23%	7%

A telling result of this analysis is that, compared with the items listed above, demographic differences are comparatively slight between low-income patients with higher- and lower-scoring patient-provider relationships. The variables that matter are the ones safety net providers can work toward achieving.

endnotes

5 A health coach or healthcare navigator was defined as follows: "…a person whose job it is to help people get the appointments, information and services they need, make sure their questions have been addressed, or may even call to check in on them between visits." Team-based care was defined as follows: "Each patient gets a healthcare team that includes a doctor, a healthcare navigator, a nurse or physician's assistant and a health educator. The same team always works with that patient."

6 Adding the variables mentioned here to a linear regression, the beta for income as a predictor of quality-of-care ratings drops from .18 to .08. See Appendix B.

7 Index scores of 3.32 vs. 3.16, $p < .001$. See Appendix B.

8 Adding the variables mentioned here to a linear regression, the beta for income as a predictor of a positive patient-provider relationship drops from .13 to .01. See Appendix B.

part c: conclusions and recommendations

This study has one broad, expected result and one key, unexpected one. The former is that higher-income Californians report substantially better healthcare experiences than do those with low incomes. The latter is that while income inequality has been a persistent and perplexing problem in the healthcare field, it's not about incomes per se, but about the nature of care afforded to individuals in these groups. Some low-income Californians in fact rate their care as highly as do higher-income patients – and the motivators behind those higher ratings can be identified.

That insight opens substantial opportunities for steps to close the gap. Patients' self-assessed information levels, their relationships with care providers and their ratings of the quality of the care they receive – all lower among low-income Californians – depend, to a substantial extent, on the way their care is delivered. Moving to more patient-centered care models, in which patients feel personally connected with their care facility and caregivers, changes the equation.

Measures, discussed above and covered in depth in previous reports, include encouraging care providers to empower their patients to participate in care decisions; using team care and healthcare navigators to enhance connectedness, continuity and trust within available resources; improving multicultural and linguistic accessibility, and using health information technology to inform and connect with patients in increasingly effective, efficient ways.

While these solutions vary in cost and ease of implementation, the key takeaway is that income inequality in healthcare experiences need not be a given. This report identifies clear steps that can be taken to help close the income gap in patients' experience of care. Taking these steps not only can improve low-income patients' information, involvement and satisfaction with their care, but can lift these to the level experienced by their higher-income counterparts. Safety net providers thus have it within their power to level the playing field in the quality of care Californians experience, regardless of their income disparities.

Patients' information, their relationships with care providers and their ratings of the quality of their care all depend, to a substantial extent, on the way that care is delivered.

appendix a – topline data report

This appendix provides complete question wording and topline results for data included in this report on the 2013 Blue Shield of California Foundation survey.

*= less than 0.5 percent

1z. I'd like to ask you about your overall health. In general, would you say your health is excellent, very good, good, fair or poor?

		Excellent/very good				Fair/poor			
		NET	Excellent	Very good	Good	**NET**	Fair	Poor	No opinion
6/18/13	All	52	20	32	29	19	15	4	*
	<200% FPL	35	12	22	34	31	25	7	*
	200%+ FPL	61	24	37	26	13	11	2	*

1. About how many times in the past year have you seen a doctor, nurse or other healthcare provider?

		None	Once	2-5 times	6+ times	No opinion	Mean	Median
6/18/13	All	16	23	42	17	1	4.55	2
	<200% FPL	19	21	40	18	2	4.83	2
	200%+ FPL	15	25	44	16	*	4.38	2

2/2a/3/4. Where do you usually go when you are sick or need health care for any reason – (Kaiser), (a private doctor's office), (a community clinic or health center), (a hospital) or someplace else? (IF NO USUAL PLACE) Where's the last place you went? [Follow-ups specified – see questionnaire.]

6/18/13

	All	**<200% FPL**	**200%+ FPL**
Kaiser Permanente	19	9	24
Private doctor's office	41	25	50
Clinic NET	**27**	**48**	**17**
Community clinic or health center	8	16	5
Public hospital clinic	5	11	2
Private/religious hospital clinic	4	3	4
Hospital clinic other/unknown type	*	1	-
County/city clinic	1	3	1
Private clinic	4	6	3
Clinic other/unknown type	5	8	3
Hospital emergency room	5	9	3
Hospital unspecified	1	1	1
Someplace else	5	6	4
Never have gone for health care*	1	1	*
No opinion	1	1	*

*Asked 1z, Q2-4, 7, 16-25, 27-29, 42-44, 55-59, 1z2 and demographics.

5/5a. Thinking about the place where you usually go for health care,* how would you rate the health care you receive – excellent, very good, good, not so good or poor?

		Excellent/very good				Not so good/poor			
		NET	Excellent	Very good	Good	**NET**	Not so good	Poor	No opinion
6/18/13	All	63	36	27	30	6	5	2	*
	<200% FPL	49	26	23	41	9	6	3	1
	200%+ FPL	69	40	29	25	5	4	1	*

*If no usual place: "the last time you received health care"

6. Thinking about the people working at the place where you (usually go/ last went) for care, do you feel there's a person there who knows you pretty well, or not really?

		Yes	No	No opinion
6/18/13	All	47	52	1
	<200% FPL	38	61	1
	200%+ FPL	52	48	1

7. How often do you see the same healthcare provider when you have a healthcare appointment – every time, most of the time, some of the time, rarely or never?

		Usually				Rarely/never			
		NET	Every time	Most of the time	Some of the time	**NET**	Rarely	Never	No opinion
6/18/13	All	66	39	27	14	19	13	6	1
	<200% FPL	53	29	24	21	25	16	9	1
	200%+ FPL	72	44	28	11	16	11	5	*

8. Some places have a person whose job it is to help people get the appointments, information and services they need, make sure their questions have been addressed, or may even call to check in on them between visits. There are different names for this kind of role, for example a healthcare navigator or healthcare coach. Do you personally have a health navigator or health coach at the place you (go/last went) for care, or not?

		Yes	No	No opinion
6/18/13	All	17	79	4
	<200% FPL	21	74	5
	200%+ FPL	15	81	3

9. (IF DOES NOT HAVE HEALTH NAVIGATOR, Q8) How interested would you be in having a healthcare navigator providing these services – very interested, somewhat interested, not so interested or not interested at all?

		Interested			Not interested			
		NET	Very	Somewhat	**NET**	Not so	At all	No opinion
6/18/13	All	42	15	26	57	22	35	1
	<200% FPL	50	20	30	49	21	28	1
	200%+ FPL	38	14	25	61	23	38	1

10. Some places have what's called team-based care. Each patient gets a healthcare team that includes a doctor, a healthcare navigator, a nurse or physician's assistant and a health educator. The same team always works with that patient. As far as you're aware do you personally have a healthcare team at the place you (go/last went) for care, or not?

		Yes	**No**	**No opinion**
6/18/13	All	27	66	7
	<200% FPL	33	59	8
	200%+ FPL	24	70	6

11. (IF DOES NOT HAVE TEAM-BASED CARE, Q10) If it was available where you go for care, how interested would you be in having team-based care – very interested, somewhat interested, not so interested or not interested at all?

		Interested			Not interested			
		NET	Very	Somewhat	**NET**	Not so	At all	No opinion
6/18/13	All	63	26	37	36	15	20	1
	<200% FPL	72	32	40	27	12	15	2
	200%+ FPL	60	23	37	39	16	22	1

Q12 previously released.

13. When you go for medical care, how often does the healthcare provider [ITEM] – every time, most of the time, some of the time, rarely or never?

6/18/13 - Summary Table

	Usually				Rarely/never			
	NET	Every time	Most times	Some of the time	**NET**	Rarely	Never	No op.
a. Explain things in a way you understand								
All	87	56	31	9	4	4	1	*
<200% FPL	80	53	27	14	7	5	1	*
200+% FPL	91	57	34	6	3	3	*	0
b. Ask you if you have any questions or concerns								
All	82	62	20	13	5	11	2	*
<200% FPL	76	58	18	14	9	11	4	*
200%+ FPL	85	64	21	12	3	11	1	*

14. Overall, would you say the healthcare providers you see [(encourage you to take an active role in decisions about your care), (discourage you from taking an active role in decisions about your care)] or neither [(encourage) nor (discourage)] your taking an active role?

		Encourage	Discourage	Neither	No opinion
6/18/13	All	70	4	24	2
	<200% FPL	69	5	23	3
	200%+ FPL	70	3	25	2

15. How comfortable or uncomfortable do you feel [ITEM] – very comfortable, somewhat comfortable, somewhat uncomfortable or very uncomfortable?

	Comfortable			Not comfortable			
	NET	Very	Somewhat	**NET**	Somewhat	Very	No op.
a. Asking the healthcare provider questions about your health or treatment							
All	94	72	22	6	4	1	*
<200% FPL	90	64	27	9	7	2	*
200+% FPL	96	76	20	4	3	1	0
b. Telling the healthcare provider about health information you've obtained from other sources							
All	88	62	26	10	8	2	2
<200% FPL	84	54	31	14	10	3	2
200%+ FPL	90	66	24	9	7	2	1
c. Telling the healthcare provider that you don't want to do something they recommend							
All	82	56	26	16	13	4	1
<200% FPL	77	50	26	21	15	6	2
200%+ FPL	85	59	26	14	12	2	1

16. On another topic, do you personally have access to the internet or e-mail, or not?

		Yes	No	No opinion
6/18/13	All	77	23	0
	<200% FPL	58	42	0
	200%+ FPL	87	13	0

17. (IF HAS INTERNET ACCESS, Q16) Does that include internet or e-mail access through a smartphone, or not?

		Yes	No	No opinion
6/18/13	All	76	24	*
	<200% FPL	67	33	*
	200%+ FPL	79	21	*

16/17 NET:

		Has internet access				
		NET	Smartphone	No smartphone	No internet	No opinion
6/18/13	All	77	59	18	23	0
	<200% FPL	58	39	19	42	0
	200%+ FPL	87	69	18	13	0

18. (IF DOES NOT HAVE INTERNET ACCESS, Q16) Do you have a cell phone that can send and receive text messages, or not?

		Yes	No	No opinion
6/18/13	All	88	12	*
	<200% FPL	80	20	*
	200%+ FPL	91	8	*

19. (IF HAS INTERNET ACCESS, Q16) Have you ever used (the internet/the internet or your smartphone) to access any health or wellness websites or applications, or not?

		Yes	No	No opinion
6/18/13	All	67	33	*
	<200% FPL	56	44	0
	200%+ FPL	70	29	*

16/19 NET:

		Has internet access				
		NET	Used for health info.	Hasn't used for health info.	No internet	No opinion
6/18/13	All	77	52	25	23	0
	<200% FPL	58	33	26	42	0
	200%+ FPL	87	61	26	13	0

20-21 previously released.

22. In general, how informed do you feel about your health and any health problems you may have – very informed, somewhat informed, not so informed or not informed at all?

		Informed			Not informed			
		NET	Very	Somewhat	**NET**	Not so	At all	No opinion
6/18/13	All	89	51	38	10	7	3	1
	<200% FPL	82	43	39	17	10	6	1
	200%+ FPL	93	55	38	7	6	2	*

23. (Do you feel like you have all the information you need to make informed decisions about your health), or (do you feel that having more information than you have now would help you make better decisions about your health)?

		Have all I need	**More info. would help**	**Have more than need (vol.)**	**No opinion**
6/18/13	All	47	51	*	1
	<200% FPL	43	55	1	2
	200%+ FPL	49	50	*	1

24. (IF FEELS LIKE MORE INFORMATION WOULD HELP, Q23) How much more information about your health would you like to have – a lot more, just some or only a little more?

		A lot	**Some**	**A little**	**No opinion**
6/18/13	All	49	37	14	*
	<200% FPL	56	30	14	1
	200%+ FPL	46	41	13	0

23/24 NET:

		Want more health info.						
		NET	A lot	Some	A little	Have all I need	Have more than need (vol.)	No op.
6/18/13	All	51	25	19	7	47	*	1
	<200% FPL	55	30	16	8	43	1	2
	200%+ FPL	50	23	20	7	49	*	1

25. (IF HAS ALL INFORMATION NEEDED, Q23) Imagine if more information about your health was easier to find and to understand. In that case would you (like to have more information than you have now), or would you (still say you already have enough information)?

		Like more	Have enough	No opinion
6/18/13	All	38	61	1
	<200% FPL	37	63	*
	200%+ FPL	39	60	1

23/25 NET:

		Want more health info			Have all I need	Have more than need (vol.)	No op.
		NET	In general	If easier to find/und.			
6/18/13	All	51	29	18	47	*	1
	<200% FPL	55	27	16	43	1	2
	200%+ FPL	50	30	19	49	*	1

26. Overall, have you found that the health information you've received from healthcare providers has been (as simple as it can be) to understand, or (more complicated than it should be)? Do you feel that way strongly or somewhat?

		Simple			Complicated			Depends (vol.)	No info. from doc. (vol.)	No op.
		NET	Str.	Smwt.	NET	Smwt.	Str.			
6/18/13	All	69	43	26	27	16	11	1	*	2
	<200% FPL	71	47	24	25	14	11	1	*	2
	200%+ FPL	68	41	28	29	18	11	1	*	2

27. Do you find searching for health information on your own more (helpful) or more (overwhelming)? Do you feel that way strongly or somewhat?

		Helpful			Overwhelming			Haven't tried (vol.)	No op.
		NET	Str.	Smwt.	NET	Smwt.	Str.		
6/18/13	All	67	38	29	28	17	11	2	2
	<200% FPL	62	31	32	34	21	13	2	2
	200%+ FPL	70	42	28	25	15	10	2	3

28. Where do you get most of the information you have about your health – (from healthcare providers), (from friends and family), or (from sources like books, magazines, television or the internet)?

		Providers	Family	Books/TV	Other (vol.)	Multiple (vol.)	Don't get info. (vol.)	No op.
6/18/13	All	41	14	37	1	7	1	*
	<200% FPL	38	15	39	1	5	1	1
	200%+ FPL	42	13	36	1	8	1	0

29. Thinking about different sources of health information, how much do you think you can trust health information you can get from [ITEM] – can you trust it completely, mostly, somewhat, not much or not at all?

6/18/13 - Summary Table

	More trust				Less trust			
	NET	Completely	Mostly	Somewhat	NET	Not much	Not at all	No op.
a. Doctors you see								
All	81	33	48	14	4	3	1	*
<200% FPL	70	29	42	19	10	6	4	1
200%+ FPL	87	35	51	12	1	1	0	*
b. Nurses, physician assistants or other medical staff you see								
All	69	21	47	23	8	5	3	1
<200% FPL	61	19	42	25	13	8	5	1
200%+ FPL	73	23	50	22	5	4	1	*
c. (IF HAS HEALTHCARE COACH, Q8) Your healthcare coach								
All	73	32	41	18	6	4	2	4
<200% FPL	71	25	46	20	8	5	3	1
200%+ FPL	74	37	37	17	4	4	1	5

Q29d-g, Q30a-b previously released.

31a. (IF HAS INTERNET ACCESS, Q16) Do the healthcare providers or staff at the place you (usually go/last went) for health care ever send you e-mails, or not?

		Yes	No	No opinion
6/18/13	All	36	64	0
	<200% FPL	22	78	0
	200%+ FPL	40	60	0

Q31b-Q33 previously released.

34. (IF HAS INTERNET ACCESS, Q16) As far as you know, when you have a question, can you get an answer by e-mailing the healthcare providers or staff at the place you (usually go/last went) for care, or not?

		Yes	No	No opinion
6/18/13	All	42	45	12
	<200% FPL	32	57	10
	200%+ FPL	45	42	13

Q35-37 previously released.

38. Some healthcare facilities have a website where patients can go to do things like (make appointments), (view their medical records and test results), (ask doctors or nurses questions) and (find health information). It's sometimes called a patient portal. As far as you know, does the place where you (usually go/last went) for care have such a website or patient portal, or not?

		Yes	No	No opinion
6/18/13	All	37	44	19
	<200% FPL	29	50	21
	200%+ FPL	40	41	19

Q39-41 previously released.

42. Changing topics, how much of a say do you feel you currently have in decisions about your health care – a great deal of say, a good amount, just some or only a little?

		Has more say			Has less say				
		NET	Great deal	Good amount	**NET**	Some	Little	None (vol.)	No opinion
6/18/13	All	75	46	29	24	14	10	1	1
	<200% FPL	66	37	29	33	18	15	1	1
	200%+ FPL	79	50	29	20	12	7	1	2

43. Regardless of your current amount of say, how much of a say would you LIKE to have in decisions about your health care – a great deal of say, a good amount, just some or only a little?

		Want more say			Want less say				
		NET	Great deal	Good amount	**NET**	Some	Little	None (vol.)	No opinion
6/18/13	All	89	68	21	10	6	4	*	1
	<200% FPL	83	57	25	17	11	6	*	*
	200%+ FPL	92	73	19	7	4	3	*	1

44. How confident are you in your ability to make decisions about your health care – very confident, somewhat confident, not so confident or not confident at all?

		Confident			Not confident			
		NET	Very	Somewhat	**NET**	Not so	At all	No opinion
6/18/13	All	95	66	29	5	4	1	*
	<200% FPL	93	61	32	7	5	2	*
	200%+ FPL	95	68	27	5	4	1	0

Q45-56 held for release.

57. On another topic, do you have any disability or chronic medical condition that requires ongoing health care, or not?

		Yes	**No**	**No opinion**
6/18/13	All	22	78	*
	<200% FPL	23	76	*
	200%+ FPL	21	79	*

58. (IF HAS DISABILITY OR CHRONIC CONDITION, Q57) At what age were you first diagnosed with a disability or chronic condition?

		<29	**30-39**	**40-49**	**50-64**	**Not diagnosed (vol.)**	**No opinion**	**Mean**	**Median**
6/18/13	All	38	19	26	14	*	2	32.9	35
	<200% FPL	43	20	21	13	1	2	31.3	33
	200%+ FPL	37	19	28	15	0	2	33.8	35

59. What is your main source of health insurance coverage, if any?

6/18/13

	All	<200% FPL	200%+ FPL
Private NET	**65**	**33**	**81**
Employer-purchased insurance	55	25	71
Self-purchased insurance	10	9	10
Government subsidized NET	**16**	**35**	**9**
MediCal, also known as Medicaid	10	24	3
Any other state health insurance program	3	5	2
V.A., Tri-Care, military, federal	3	3	3
Indian Health Service	*	*	0
Medicare	1	1	1
Medicare and MediCal	*	1	*
None, you are uninsured	17	30	10
No opinion	1	2	1

Selected demographics:

6/18/13

	All	<200% FPL	200%+ FPL
Sex			
Male	49	47	50
Female	51	53	50
Age			
19-29	25	33	22
30-39	22	23	22
40-49	22	21	23
50-64	30	23	33
Relationship status			
Married	47	34	54
Living with a partner	13	17	10
Widowed	2	2	2
Divorced	6	7	6
Separated	3	5	2
Single	28	35	25

6/18/13 – Summary Table

	All	<200% FPL	200%+ FPL
Employment status			
Employed, full-time	53	34	63
Employed, part-time	18	26	15
Not employed NET	**28**	**40**	**22**
Retired	4	4	4
Homemaker	7	9	5
Student	5	6	4
Unemployed	9	13	6
Disabled	4	6	2
Other	1	1	*
No opinion	*	1	*
Education			
Less than high school NET	**17**	**32**	**9**
8th grade or less	7	13	4
Some high school	10	18	6
High school graduate	21	26	19
Some college/associates degree	33	31	34
College graduate NET	**29**	**12**	**37**
Graduated college	19	9	23
Post graduate	10	2	14
Race/Ethnicity			
White, non-Latino	42	27	49
Black, non-Latino	6	7	6
Latino NET	**36**	**53**	**28**
White Latino	24	34	20
Black Latino	7	13	4
Latino unspecified	5	7	4
Asian	12	9	13
Multiracial	2	2	3
Other	1	2	1
Income			
<$16,000	10	29	0
$16,000-$30,999	18	46	4
$31,000-$52,999	22	16	25
$53,000+ NET	**45**	**2**	**68**
$53,000-$99,999	24	2	35
$100,000+	21	0	33
No opinion	5	7	4

appendix b – statistical modeling

Several sections of this study refer to statistical analyses used to measure the relationships among attitudes, demographic variables and outcomes. These analyses are based on mediation modeling using a series of linear regressions, as detailed in this appendix.[1]

A regression measures the independent strength of the relationship between predictor variables (such as attitudes and demographics) with a posited outcome, known as the dependent or outcome variable, such as, in the case of this study, satisfaction with one's healthcare or an index of the quality of the relationship between a patient and his or her care provider.

While it does not establish causality, a regression reveals the strength of the relationship between a predictor (e.g., having team-based care) and the dependent variable (e.g., the patient-provider relationship), with other predictors in the model held constant. While many variables may be related to a given outcome, a regression identifies the extent to which each predictor explains unique variance in the dependent variable after adjusting for these other relationships.

mediation models

Mediation modeling was used in this study to identify the factors that influence the income gap between low- and higher-income Californians in some of the key outcome variables of interest. A mediation model is a series of regressions that help to clarify the relationship between a predictor variable and an outcome variable by examining potential underlying processes.

Simple linear regression reveals the direct relationship between income level[2] as an independent variable and feeling informed, satisfaction with care and patient-provider relationships[3] as outcome variables. But there also may be an indirect relationship between the independent variable and the outcome variable through a third variable, acting as a mediator. For example, higher-income respondents may be more apt to have a personal connection with someone at their care facility, which, in turn, may predict greater satisfaction with their overall quality of care. Mediation analyses allow us to explore these potential indirect relationships.

Specifically, we hypothesized that broad differences by income level in Californians' health information, satisfaction with care and relationships with providers may be explained by differences in specific aspects of patients' care experiences – such as how connected they feel to their facility, how frequently they see the same provider (i.e., their continuity of care), how much they trust medical sources of information[4] and the extent to which they use health information and communication technology (such as texting or e-mailing with providers),[5] as well as their primary language,[6] which can impact patients' care experience if providers and staff are not multilingual.

To test the mediation models, we followed Baron and Kenny's (1986) steps for mediation, which include the following:

1. Regressing the outcome variable on the independent variable (x → y) to confirm that the independent variable (IV) does in fact predict the outcome of interest when no other variables are included (e.g., that income level predicts satisfaction with care when no other variables are entered).

2. Regressing the mediator on the independent variable (x → m) to confirm that there is a significant relationship between the two variables (e.g., that income level predicts feeling connected to one's facility).

3. Regressing the outcome variable on both the mediator and the independent variable (x and m → y) to confirm that the mediator is a significant predictor of the outcome, and that the relationship between the IV and the outcome variable assessed in Step 1 is reduced once the mediator is included (e.g., to show that connectedness is a significant predictor of satisfaction with care, and that the effect of income on satisfaction with care is less than it was in Step 1).

We then computed a Sobel z-test, which tests whether the indirect effect of the IV on the outcome through the mediator is statistically significant. If a statistically significant mediation is confirmed, it means that the effect of the IV on the outcome variable (shown in Step 1) is at least partially (or entirely) due to the fact that the IV influences the mediator, which in turn influences the outcome variable. In other words, the mediator explains the process through which the IV influences the outcome.

The tables below show the results of each of the posited mediators separately for each of the three key dependent variables (feeling informed, satisfaction with care and patient-provider relationships). The final model for each dependent variable combines each of the individual mediators to show the collective effect.

mediation models predicting self-assessed information levels

The models below assess the extent to which the relationship between income level and self-assessed health information are attenuated by variables including patients' relationship with their provider (the patient-provider index), trust in medical sources, connectedness (whether or not the patient feels that someone at their facility knows them pretty well), continuity (how frequently the patient sees the same healthcare provider, primary language and the extent to which patients use health information technology. In each case, the models show a reduction in the impact of income level on how informed the respondent feels (as indicated by the reduction in the standardized coefficient), and a Sobel z-test confirms that these reductions are statistically significant. The final model shows the extent to which the predictive power of income is attenuated when all of these variables are simultaneously entered as controls.

	standardized coefficient (β)	significance test (*t*)
step 1 in all models: income level → feel informed	.14	5.67***
mediation model 1: patient-provider index		
step 2: income level → patient-provider index	.13	5.20***
step 3: income level + patient-provider index → feel informed		
income level	.08	3.59***
patient-provider index	.47	20.90***
Sobel test		5.07***
mediation model 2: trust in medical sources		
step 2: income level → trust in medical sources	.17	6.86***
step 3: income level + trust in medical sources → feel informed		
income level	.09	3.53***
trust in medical sources	.34	13.74***
Sobel test		6.14***
mediation model 3: continuity		
step 2: income level → continuity	.17	6.58***
step 3: income level + continuity → feel informed		
income level	.10	4.00***
continuity	.27	10.72***
Sobel test		5.59***
mediation model 4: connectedness		
step 2: income level → connectedness	.13	5.20***
step 3: income level + connectedness → feel informed		
income level	.11	4.41***
connectedness	.26	10.54***
Sobel test		6.05***

mediation model 5: speaks English		
step 2: income level → speaks English	.25	10.22***
step 3: income level + speaks English → feel informed		
income level	.08	3.23**
speaks English	.24	9.50***
Sobel test		3.61***
mediation model 6: current use of health information and communication technology		
step 2: income level → current health info./comm. technology use	.27	10.73***
step 3: income level + current health info./comm. technology use → feel informed		
income level	.08	3.26**
current health info. technology use	.23	8.80***
Sobel test		6.89***
combined model: predicting how informed patients' feel		
step 2: income level + patient-provider index, trust in medical sources, connectedness, continuity, speaks English, current health info. technology use → feel informed		
income level	.01	.40
patient-provider index	.35	13.09***
speaks English	.12	4.93***
continuity	.11	4.33***
trust in medical sources	.11	4.15***
current health info. technology use	.07	2.91**
connectedness	.04	1.47

Here and below: ***$p < .001$, **$p < .01$, *$p < .05$, +$p < .10$

mediation models predicting satisfaction with care

The models below are similar to those described above, but focus on the relationship between income level and satisfaction with care. In addition, for analytical purposes, the index reflecting current use of health information and communication technology was broken into two subindices. One, measuring current use of communication technology for health purposes, includes questions assessing patients' use of e-mails and text-messaging to communicate with their providers. The second, measuring current use of health information resources, includes questions assessing use of websites or smartphone applications to gather information and advice.

	standardized coefficient (β)	significance test (*t*)
step 1 in all models: income level → satisfaction with care	.18	7.17***
mediation model 1: patient-provider index		
step 2: income level → patient-provider index	.13	5.20***
step 3: income level + patient-provider index → satisfaction with care		
income level	.12	5.28***
patient-provider index	.48	21.23***
Sobel test		5.08***
mediation model 2: trust in medical sources		
step 2: income level → trust in medical sources	.17	6.86***
step 3: income level + trust in medical sources → satisfaction with care		
income level	.12	4.95***
trust in medical sources	.37	15.20***
Sobel test		6.23***
mediation model 3: current use of health information and communication technology		
step 2: income level → current health info./comm. technology use	.27	10.73***
step 3: income level + current health info./comm. technology use → satisfaction with care		
income level	.13	5.15***
current health info. technology use	.18	7.07***
Sobel test		5.96***
mediation model 3a: current use of communication technology for health purposes		
step 2: income level → current communication technology use	.23	9.27***
step 3: income level + current communication technology use → satisfaction with care		
income level	.14	5.33***
current communication technology use	.20	7.67***
Sobel test		5.84***
mediation model 3b: current use of health information resources		
step 2: income level → current health information use	.22	8.67***
step 3: income level + current health information use → satisfaction with care		
income level	.17	6.57***
current health information use	.05	2.02*
Sobel test		1.97*

mediation model 4: connectedness		
step 2: income level → connectedness	.13	5.20***
step 3: income level + connectedness → satisfaction with care		
income level	.14	5.83***
connectedness	.30	12.23***
Sobel test		4.77***
mediation model 5: continuity		
step 2: income level → continuity	.17	6.58***
step 3: income level + continuity → satisfaction with care		
income level	.15	5.78***
continuity	.22	8.79***
Sobel test		5.27***
mediation model 6: feel informed		
step 2: income level → feel informed	.14	5.67***
step 3: income level + feel informed → satisfaction with care		
income level	.14	5.77***
feel informed	.28	11.12***
Sobel test		5.09***
combined model: predicting satisfaction with care		
step 2: income level + patient-provider index, trust in medical sources, current health info. technology use, connectedness, continuity and feel informed → satisfaction with care		
income level	.08	3.31**
patient-provider index	.33	11.97***
trust in medical sources	.17	6.51***
current health info. technology use	.04	1.69+
connectedness	.12	4.70***
continuity	.03	1.35
feel informed	.01	.47

mediation models predicting patient-provider relationships

The models below are similar to those described above, but focus on the relationship between income level and the patient-provider index

	standardized coefficient (β)	significance test (*t*)
step 1 in all models: income level → patient-provider index	.13	5.20***
mediation model 1: connectedness		
step 2: income level → connectedness	.13	5.20***
step 3: income level + connectedness → patient-provider index		
income level	.08	3.51***
connectedness	.37	15.17***
Sobel test		4.90***
mediation model 2: continuity		
step 2: income level → continuity	.17	6.58***
step 3: income level + continuity → patient-provider index		
income level	.09	3.50***
continuity	.27	10.87***
Sobel test		5.65***
mediation model 3: speaks English		
step 2: income level → speaks English	.25	10.22***
step 3: income level + speaks English → patient-provider index		
income level	.08	3.23**
speaks English	.19	7.43***
Sobel test		6.07***
mediation model 4: current use of health information and communication technology		
step 2: income level → current health info./comm. technology use	.27	10.73***
step 3: income level + current health info./comm. technology use → patient-provider index		
income level	.07	2.75**
current health info. technology use	.23	8.99***
Sobel test		6.98***
mediation model 4a: current use of communication technology for health purposes		
step 2: income level → current communication technology use	.23	9.27***
step 3: income level + current communication technology use → patient-provider index		
income level	.08	3.15**
current communication technology use	.23	8.75***
Sobel test		6.31***

mediation model 4b: current use of health information resources		
step 2: income level → current health information use	.22	8.67***
step 3: income level + current health information use → patient-provider index		
income level	.11	4.35***
current health information use	.09	3.40***
Sobel test		3.17**
mediation model 5: feel informed		
step 2: income level → feel informed	.14	5.67***
step 3: income level + feel informed → patient-provider index		
income level	.06	2.82**
feel informed	.48	20.90***
Sobel test		5.50***
combined model: predicting the patient-provider index		
step 2: income level + connectedness, continuity, speaks English, current health info. technology use and feel informed → patient-provider index		
income level	.01	.34
connectedness	.22	9.02***
continuity	.05	2.14*
speaks English	.04	1.58
current health info. technology use	.09	3.70***
feel informed	.38	16.01***

mediation summary table:

strength of income level as a predictor with control variables entered individually and then entered in combination

	feel informed	satisfaction w/care	patient-prov. relationship
No controls	.14***	.18***	.13***
Control variables:			
patient-provider index	.08***	.12***	–
speaks English	.08**	–	.08**
continuity	.10***	.15***	.09***
connectedness	.11***	.14***	.08***
trust in medical sources	.09***	.12***	–
current use of health information and communication technology	.08***	.13***	.07**
feel informed	–	.14***	.06**
All control variables entered simultaneously	.01	.08**	.01

endnotes

1 For a full report of the survey methodology see Appendix C of "Building Better Healthcare for Low-Income Californians," published by Blue Shield of California Foundation in October 2013.

2 Income level in these analyses is a dichotomous variable reflecting household incomes less than 200 percent of the federal poverty level (FPL) vs. incomes of 200 percent FPL or more.

3 Patient-provider relationships are assessed using an index that averages responses to questions 12, 13a-b, 15a-c, 26 and 42 in the survey. These items assess patients' perception that their providers care about them personally (Q. 12); the frequency providers' explain things in a way they can understand (Q. 13a) and ask them if they have any questions (Q. 13b); how comfortable patients feel asking their healthcare provider questions (Q. 15a), telling them about health information they've obtained from other sources (Q. 15b) and telling them that they don't want to do something the provider recommends (Q. 15c); how simple or complicated they find the information they've received from their providers to be (Q. 26); and how much say they feel they currently have in their care (Q. 42).

4 Trust in medical sources of information is assessed using an index that averages responses to question 29a- c, in which respondents rate how much they think they can trust health information from (a) doctors they see; (b) nurses, physician assistants or other medical staff they see; and (c) their healthcare coach, among those who have one.

5 Patients' current use of health information and communication technology is assessed using an index based on responses to questions 19, 20a-f, 30a, 31a, 32a, 33 and 34. It essentially counts the number of the following health technology-related behaviors the patient has done: used the internet for health reasons (Q. 19); used a website or smartphone application to do any of the following: look for information about a health problem (Q. 20a), look for information or advice about dieting, nutrition or exercise (Q. 20b), find support or advice from people with similar health issues (Q. 20c), share a personal health experience or read about someone else's (Q. 20d), receive automatic health messages or reminders (Q. 20e) or track health, exercise or nutrition information (Q. 20f); received texts, e-mails or phone calls from their provider or facility (Q. 30a, Q. 31a and Q. 32a); and sent questions to their provider via text or e-mail (Q. 33 and Q. 34).

6 We include patients' primary language (English or not) as a mediator because unlike other demographic factors (e.g., age, race, gender), the impact of patients' language on their experience of care is something that can be addressed (e.g., by enhancing access to multilingual medical staff and resources). Therefore testing whether it mitigates the impact of income levels can provide useful information to safety-net providers.

Blue Shield of California Foundation
50 Beale Street
San Francisco, CA 94105

blueshieldcafoundation.org
email: bscf@blueshieldcafoundation.org