1. **INTRODUCTION**

In early 2008, Oregon opened a waiting list for a limited number of spots in its Medicaid program for low-income adults, which had previously been closed to new enrollment. The state drew names by lottery from the 90,000 people who signed up. This lottery presents the opportunity to study the effects of access to public insurance using the framework of a randomized controlled design.

Although there are literally hundreds of studies comparing the health and health care utilization of insured and uninsured populations (see Institute of Medicine (2003)), inferring the impact of health insurance from such comparisons is difficult because individuals with and without insurance coverage differ in many ways—such as income, employment, or health—that are likely to be correlated with the outcomes of interest.\(^1\) Random assignment of health insurance to some but not others would avoid such confounding, but has never been done before in the United States.\(^2\)

In this paper we examine the effects of the Oregon Medicaid lottery after approximately one year of insurance coverage. We present comparisons of outcomes between the treatment group (those selected by the lottery who had an opportunity to apply for Medicaid) and the control group (those not selected and thus not able to apply for Medicaid). We also present estimates of the impact of insurance coverage, using the lottery as an instrument for insurance coverage.

We organize our analysis around the potential costs and benefits of health insurance. On the cost side, we examine the impact of health insurance on increased health care utilization. On the benefit side, we examine the impact of health insurance not only on health, which is a standard topic of analysis, but also on consumption smoothing, which we proxy for with measures of financial strain. There is remarkably

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\(^1\) A much smaller number of studies have used quasi-experimental variation in the availability of public insurance to assess the effects of insurance. While such studies can improve on observational studies, this work has focused primarily on children or the elderly because of the available variation and, as with all quasi-experimental studies, the validity of the results depends on untestable identifying assumptions.

\(^2\) The famous RAND Health Insurance Experiment from the 1970s – the only other randomized controlled health insurance experiment that we know of in a developed country – was designed to investigate the marginal impact of varying insurance cost-sharing features among approximately 6,000 insured individuals, not the effect of insurance coverage itself (Newhouse et al., 1993, Manning et al., 1987).
little empirical work on the impact of health insurance on consumption smoothing or financial strain, even though risk spreading is arguably the primary purpose of health insurance (see e.g. Zeckhauser 1970). A priori, the sign – let alone magnitude – of the impact of health insurance on these various outcomes is not obvious. Although the price and income effects of subsidized health insurance should increase health care utilization, it is possible that increasing primary care utilization or improving health could result in offsetting reductions in hospital or emergency department use. Similarly, although health insurance is expected to improve health through increases in the quantity and quality of health care, it is also possible that by reducing the adverse financial consequences of poor health, health insurance may discourage investments in health and thereby worsen health outcomes.

Moreover, for our low-income study population, the value of Medicaid relative to the existing safety net options is uncertain. The impact of Medicaid could be attenuated (or potentially non-existent) if public health clinics and uncompensated care allow individuals to consume de facto free medical care similar to that of the insured. Medicaid’s impact would also be attenuated if – as is often conjectured – Medicaid itself is not particularly “good” insurance – at least in terms of being able to access health care providers.

Our analysis draws on administrative data from hospital discharge, credit report, and mortality records, as well as on responses to a large mail survey that we conducted. The administrative data are objectively measured and should not be biased by the treatment and control groups differentially reporting outcomes, but they only cover a relatively narrow set of outcomes. The survey data allow examination of a much richer set of outcomes than is feasible with administrative data alone, but, with a 50 percent response rate, are subject to potential non-response bias. Our available evidence on this issue is reassuring, but limited; response rates and available pre-randomization measures appear reasonably balanced between treatment and control responders.\(^3\)

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\(^3\) Non-response or attrition bias is always an important concern in interpreting results from a randomized experiment using non-administrative data. For example, in the RAND Health Insurance Experiment, response rates varied by 24 percentage points across treatment arms with different insurance coverage, from 87 percent for those randomized into the most generous plan to 63 percent for those randomized into the least generous plan (Newhouse et al., 1993).
Prior to looking at the data on outcomes for the treatment group, virtually all of the analysis presented here was pre-specified and publicly archived in a detailed analysis plan.\textsuperscript{4} This was designed to minimize issues of data and specification mining and to provide a record of the full set of planned analyses. Although pre-specification of hypotheses is the norm for randomized controlled medical trials, to our knowledge is it extremely rare in evaluation of social policy experiments.\textsuperscript{5}

About one year after enrollment, we find that those selected by the lottery have substantial and statistically significantly higher health care utilization, lower out-of-pocket medical expenditures and medical debt, and better self-reported health than the control group that was not given the opportunity to apply for Medicaid. Being selected through the lottery is associated with a 25 percentage point increase in the probability of having insurance during our study period. This net increase in insurance appears to come entirely through a gross increase in Medicaid coverage, with little evidence of crowd-out of private insurance. Using lottery selection as an instrument for insurance coverage, we find that insurance coverage is associated with a 2.1 percentage point (30 percent) increase in the probability of having a hospital admission, an 8.8 percentage point (15 percent) increase in the probability of taking any prescription drugs, and a 21 percentage point (35 percent) increase in the probability of having an outpatient visit; we are unable to reject the null of no change in emergency room utilization, although the point estimates suggest that such use may have increased. In addition, insurance is associated with three-tenths of a standard deviation increase in reported compliance with recommended preventive care such as mammograms and cholesterol monitoring. Insurance also results in decreased exposure to medical liabilities and out-of-pocket medical expenses, including a 6.4 percentage point (25 percent) decline in the probability of having an unpaid medical bill sent to a collection agency and a 20 percentage point (35 percent) decline in having any out-of-pocket medical expenditures. Since much medical debt is never

\textsuperscript{4} Our analysis plan was archived on December 3, 2010 at \url{http://www.nber.org/sap/20101203/} and at \url{hypotheses@povertyactionlab.org}. Some of those analyses yielded little of interest and therefore we describe them briefly, presenting the full results only in appendices. In the few instances in which the results suggested the performance of additional analyses that had not originally been planned, we have indicated this in the text and tables with a ^.

\textsuperscript{5} Within economics, we know of only a few examples in developing countries (Alatas et al. (2010), Olken, Onishi and Wong (2010) and Schaner (2010)) and none in the United States.
paid, the financial incidence of expanded coverage thus appears to be both on the newly insured and on their medical providers. Finally, we find that insurance is associated with improvements across the board in our measures of self-reported physical and mental health, averaging two-tenths of a standard deviation improvement. These results appear to reflect improvements in mental health and also at least partly a general sense of improved well being; they may also reflect improvements in objective, physical health, but this is more difficult to determine with the data we now have available.

Our estimates of the impact of public health insurance apply to able-bodied uninsured adults below 100 percent of poverty who express interest in insurance coverage. This is a population of considerable policy interest. In 2011, fewer than half of the states offered Medicaid coverage to able-bodied adults with income up to 100 percent of poverty absent specific categorical requirements (Kaiser 2011). As part of the 2010 Patient Protection and Affordable Care Act, starting in 2014 all states will be required to extend Medicaid eligibility to all adults up to 133 percent of the federal poverty level, with no financial penalties for many individuals in this income range who do not take up coverage (Kaiser 2010a, Kaiser 2010b, US GPO 2010).

The rest of the paper is structured as follows. Section two provides background on the Oregon Medicaid program and the lottery design. Section three describes the primary data sources, and section four presents our empirical framework. Section five presents our main results. Section six discusses interpretation and extrapolation of our estimates. A number of appendices – referenced in the text – provide additional details.

2. OREGON’S MEDICAID LOTTERY

The Oregon Health Plan (OHP) – created by one of the first federal waivers of traditional Medicaid rules – currently consists of two distinct programs: OHP Standard and OHP Plus. OHP Plus serves the categorically eligible Medicaid population, which includes (up to specific income thresholds) children

6 See Oregon Office for Health Policy Research (2009) for more detail on the Oregon Health Plan. The Oregon Health Plan is well known for its efforts in the 1990s to create a list of covered services for Medicaid recipients, based on available funding and evidence of their effectiveness. In practice, however, this “rationing” has not been binding on Medicaid patients (Bodenheimer, 1997).
and pregnant women, the disabled, and families enrolled in Temporary Assistance to Needy Families (TANF). OHP Standard, which is the program that was lotteried, is a Medicaid expansion program to cover low-income adults who are not categorically eligible for OHP Plus. Specifically, it covers adults ages 19 – 64, not otherwise eligible for Medicaid, who are Oregon residents, are U.S. citizens or legal immigrants, have been without health insurance for six months, have income below the federal poverty level (FPL), and have assets below $2,000.

OHP Standard provides relatively comprehensive benefits with no consumer cost sharing. It covers physician services, prescription drugs, all major hospital benefits, mental health and chemical dependency services (including outpatient services), hospice care, and some durable medical equipment. Vision is not covered nor are non-emergency dental services. Wallace et al. (2008) estimate that, in 2001-2004, average annual Medicaid expenditures for an individual on OHP Standard were about $3,000. Most care is provided through managed care organizations. Monthly enrollee premiums range from $0 to $20 depending on income (with those below 10 percent of the FPL paying $0).

At its peak in early 2002, about 110,000 people were enrolled in OHP Standard, about one-third the size of OHP Plus enrollment at that time. Due to budgetary shortfalls, OHP Standard was closed to new enrollment in 2004. By early 2008, attrition had reduced enrollment to about 19,000 and the state determined it had the budget to enroll an additional 10,000 adults. Therefore, in January 2008 the state re-opened OHP Standard to new enrollment.

Because the state (correctly) anticipated that the demand for the program among eligible individuals would far exceed the 10,000 available new enrollment slots, it applied for and received permission from the Centers for Medicare and Medicaid Services to add the new members through random lottery draws from a new reservation list. From January 28 to February 29, 2008, anyone could be added to the lottery

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7 In 2008, there were approximately 200,000 uninsured adults aged 19-64 below 100% FPL (see www.statehealthfacts.org last accessed February 2011). Adding some of these individuals to OHP Standard based on health status is not allowed by Federal law, which prevents states from determining eligibility for federal programs based on health care conditions. The state also considered enrolling individuals on a ‘first-come, first-served’ basis, but rejected that option because of concerns that this would put people without ready access to the information or the means to get on the list quickly at a disadvantage (Oregon Department of Human Services, 2008).
list by telephone, by fax, in person sign-up, by mail, or online. The state conducted an extensive public
awareness campaign about the lottery opportunity. To keep barriers to sign-up low, the sign-up form
(shown in Appendix Figure A2) requested limited demographic information on the individual and any
interested household member, and no attempt was made to verify the information or to screen for program
eligibility at sign-up for the lottery. A total of 89,824 unique individuals were placed on the list during
the five week window it was open.

The state conducted eight lottery drawings from the list, roughly equally sized and evenly staggered
from March through September 2008. Selected individuals won the opportunity – for themselves and any
household member (whether listed or not) – to apply for OHP Standard coverage; treatment thus occurred
at the household level. In total, 35,169 individuals – representing 29,664 unique households — were
selected by lottery. If individuals in a selected household submitted the appropriate paperwork within 45
days after the state mailed them an application and demonstrated that they met the eligibility requirements,
they were enrolled in OHP Standard.8 About 30 percent of selected individuals successfully enrolled.
There were two main sources of slippage: only about 60 percent of those selected sent back applications,
and about half of those who sent back applications were deemed ineligible, primarily due to failure to
meet the requirement of income in the last quarter corresponding to annual income below the poverty
level, which in 2008 was $10,400 for a single person and $21,200 for a family of four (Allen et al. 2010).
If they did successfully enroll in OHP Standard, individuals could remain enrolled indefinitely, provided
that they re-certified their eligibility status every six months.

3. Data

We briefly describe each data source here. Additional details can be found in Appendix 1.

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8 The application inquired about Oregon residence, U.S. citizenship, insurance over the last six months, household
income over the last two months, and assets (Oregon DHS, Form 7210). Documentation of identity and citizenship
(in the form of passports, birth certificates, etc) and income (in the form of pay stubs, letters from employers, etc)
was required (Oregon DHS, Form 7222). The state reviewed applications, first examining eligibility for OHP Plus
and then, if not eligible for Plus, examining eligibility for OHP Standard. Plus does not have premiums and covers
some additional services that Standard does not such as home health, elective hospital stays, physical, occupational
and speech therapy and private duty nursing (Oregon Office for Health Policy Research, 2009).
3.1. Administrative data on outcomes: hospital discharge data, credit report data, and mortality data

We obtained standard individual-level hospital discharge data for the entire state of Oregon from January 2008 through September 2009 and probabilistically matched them to the lottery list based on information provided at the time of lottery sign-up on full name, zip code and date of birth. The data include a hospital identifier, dates of admission and discharge, source of admission, detail on diagnoses and procedures, and discharge destination. Similar discharge data have been used to study the impact of health insurance in other contexts (see e.g. Doyle (2005), Card et al (2008, 2009) and Anderson et al. (2010)). Although inpatient admissions are relatively rare (the annual admission rate for our controls is only about 5 percent), they are quite expensive, accounting for about one-quarter of total medical expenditures for 18 – 64 year olds. We observe, on average, about 5 months of pre-randomization data.

We obtained detailed credit records from TransUnion’s Consumer Credit Database. Credit bureaus like TransUnion collect rich and detailed information on virtually all formal consumer borrowing, yet the analysis of such data is still relatively rare in the economics literature and, to our knowledge, has never been done before in a health insurance context. TransUnion used the full name, full address and date of birth reported at sign up to match 68.5 percent of lottery participants to their pre-randomization credit report in February 2008. The credit bureau was able to track over 97 percent of those found in the February 2008 file to their September 2009 file. Our primary outcomes of financial strain are measured in this 2009 file, which thus has an effective post-randomization “attrition rate” of 3 percent. We also observe pre-randomization outcomes measured in February 2008.

We obtained mortality data from Oregon’s Center of Health Statistics for all deaths occurring in Oregon from January 1, 2008 through September 30, 2009 and probabilistically matched our sample using full name, zip code, and date of birth.

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9 Author calculations based on publicly available tables from the 2008 Medical Expenditure Panel Survey.  
10 Avery, Calem and Canner (2003) provide an excellent, detailed discussion of credit bureau data; much of our discussion of the data and our choice of analysis variables is guided by their work.
3.2 Survey data on outcomes

We supplement the outcome measures available in the administrative data with a mail survey that was sent out in seven “survey waves” over July and August 2009 to virtually all individuals selected by the lottery and a roughly equal number of unselected individuals. The complete survey instrument is shown in Appendix Figure A4. The basic protocol involved three mail attempts. In addition, we designed a more intensive protocol (conducted on approximately 30 percent of non-respondents) which included additional tracking efforts, mailings, and phone contacts. The response rate to the basic protocol was 36 percent; following the intensive protocol, the overall weighted response rate was 50 percent, with individuals who responded to the intensive follow-up weighted by the inverse probability of their being included in the intensive follow-up subsample.

In Section 5.3, we also briefly compare some of our estimates from this main survey to those from two earlier, virtually identical surveys of the same population: an “initial survey” conducted approximately one year earlier (i.e. shortly after random assignment), and a “six month” survey conducted about mid way between the initial and main survey. The six month survey was conducted on a 20 percent subsample of the sample used in the other two surveys. The earlier surveys used similar protocols but did not have an intensive follow up arm; the initial and six month surveys achieved response rates of 45 and 42 percent respectively.

3.3 Other data

We obtained pre-randomization demographic information that the participants provided at the time of lottery sign-up. Appendix Figure A2 shows the sign-up form. We use these data primarily to construct nine “lottery list variables” which we use below to examine treatment and control balance on pre-randomization demographics.\(^\text{11}\) We also obtained state administrative records on the complete Medicaid enrollment history of lottery list participants from prior to the lottery through September 2009. We use

\(^{11}\) These nine “lottery list variables” are year of birth; sex; whether English is the preferred language for receiving materials; whether the individuals signed themselves up for the lottery or were signed up by a household member; whether they provided a phone number on sign up; whether the individuals gave their address as a PO box; whether they signed up the first day the lottery list was open; the median household income in the 2000 census from their zip code; and whether the zip code they gave is within a census-defined MSA.
these data as our primary measure of the first stage outcome (i.e. insurance coverage). We obtained broader measures of insurance coverage (including private insurance) from our mail survey. Finally we obtained state administrative records on the Food Stamp benefit history of lottery list participants from prior to the lottery through September 2009.

3.4 Time frame of the study

In the administrative data we measure outcomes from the date individuals were notified that they were selected (i.e. their “notification date”) through the end of September 2009. This observation period represents, on average, 16 months (standard deviation of 2 months) after individuals are notified of their selection and, on average 14 months (standard deviation of 3 months) after insurance coverage is approved for those selected by the lottery who successfully enrolled in OHP Standard. If an individual successfully obtained insurance through the lottery, coverage was applied retroactively to only a few days after the state mailed the application to the individual, which was on average about one month after the notification date and one month prior to the approval date.

In our survey most outcomes were asked with a six month look-back period (e.g. number of doctor visits in the last six months) or based on “current” conditions (e.g. self-reported health). There is variation across individuals in when surveys were mailed and how long they took to respond, as well as their lottery draw (and hence notification date). Our average survey response occurs 15.3 months after notification date (standard deviation = 2.7) months or 13.1 months after insurance approval (standard deviation = 2.9 months).

12 We randomly assigned lottery draws (and hence notification dates) to the control individuals as discussed in more detail in Section 4. A primary reason for measuring outcomes from notification date – which varies by up to seven months across lottery draw – rather than just measuring all outcomes from the earliest notification date of any lottery draw, is to increase the availability of “pre-randomization” hospital data for analysis. If we analyzed outcomes from the earliest notification date we would have less than 3 months of pre-randomization data; this approach gives us almost 9 months for some participants and on average 5 months.

13 The timing difference between notification and approval reflects the approximately one month lag between when the state notified individuals they had been selected and when the state mailed them an application, and then the time it took for individuals to fill out and mail in an application, and for the state to process it.

14 We suspect, and focus group interviews with selected individuals suggest, that selected individuals would have been unlikely to change their behavior while their applications were being processed; however the retroactive insurance coverage may have affected the financial burden associated with health care utilization during that time period.
3.5. Sample definition and descriptive statistics

Of the 89,824 individuals who were on the lottery list, we used pre-randomization data to exclude individuals who were not eligible for OHP Standard (because they gave an address outside of Oregon, were not in the right age range, or had died prior to the lottery), had institutional addresses, were signed up by third parties, would have been eligible for Medicare by the end of our study period, or were inadvertently included on the original list multiple times by the state. These exclusions brought our study population down to 74,922 individuals (representing 66,385 unique households). Of these, 29,834 individuals were selected by the lottery and the remaining 45,088 individuals are controls. Of these, we surveyed 29,589 treatment and 28,816 control individuals. Appendix Figure A1 shows the overlap between the full sample (which is used in the hospital discharge data and mortality analysis), the credit report subsample and the mail survey subsample.

Table 1 provides some demographic summary statistics for our control sample. Panel A, based on information provided prior to randomization on the sign up list, shows that our study population is 56 percent female; about one-quarter are 50 to 64 at the end of our study period (the average age is 41); 92 percent have a preferred language of English; and about three-quarters live in an MSA. Panel B reports additional demographic characteristics of the control group from the survey. These outcomes are only available for individuals who responded to the mail survey, and may therefore not be representative of the full sample. The population is 4 percent black, and 12 percent Hispanic. Almost one-fifth has less than a high school education, and another half has only a high school diploma or GED. Over half report that they are not currently working. Most strikingly, they appear to be in quite poor health: 18 percent report having ever been diagnosed with diabetes, 28 percent with asthma, 40 percent with high blood pressure; 56 percent screen positive for depression.15

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15 By contrast for a general adult population, 7 percent report ever being diagnosed with diabetes, 14 percent with asthma, 24 percent with high blood pressure, and 28 percent with depression. (These numbers are based on our calculation from the 2004-2009 Behavioral Risk Factor Social Surveillance Survey which uses virtually identical questions to our survey questions.) Moreover, diagnoses likely understate the level of poor health, particularly in our low-income population with limited access to providers who could diagnose disease.
Panel B also shows the distribution of household income (relative to the federal poverty level) and insurance coverage. Both are important for the first-stage impact of lottery selection on insurance coverage. About 70 percent report incomes below the eligibility cut-off of 100 percent of the federal poverty level; this is consistent with our finding from analyzing application data that income eligibility requirements disqualified a non-trivial share selected individuals (Allen et al., 2010). Finally, about 30 percent of the controls report having insurance (which would also make them ineligible for OHP Standard); 13 percent report having private insurance.

4. Empirical Framework

4.1 Reduced Form

4.1.1 Reduced Form Equation

We estimate the reduced form effect of winning the lottery with the following equation:

\[ y_{ijh} = \beta_0 + \beta_1 \text{LOTTERY}_{ih} + X_{ih} \beta_2 + \epsilon_{ijh} \]  \hspace{1cm} (1)

where \( i \) denotes an individual, \( h \) denotes a household and \( j \in J \) denotes a “domain” of related outcomes (such as health or financial strain). For example, \( y_{ij} \) might be the self-reported health of individual \( i \), which is one of the health measures in the health “domain” \( J \). We define (sign) each outcome within a domain so that higher values all have the same interpretation within a domain (e.g. more health care use, more financial strain). As we discuss below, we will summarize the estimates within a domain by the standardized treatment effect across outcomes in that domain; we will also report estimates for individual outcomes and show p-values that are adjusted to account for the multiple outcomes examined within the domain.

\( \text{LOTTERY} \) is an indicator variable for whether or not household \( h \) was selected by the lottery. The coefficient on \( \text{LOTTERY} \) (\( \beta_1 \)) is the main coefficient of interest, and gives the average difference in (adjusted) means between the treatment group (the lottery winners) and the control group (those not selected by the lottery).
We denote by $X_{ih}$ the set of covariates that are correlated with treatment probability (and potentially with the outcome) and therefore must be controlled for so that estimates of $\beta_1$ give an unbiased estimate of the relationship between winning the lottery and the outcome. In all our analyses, $X_{ih}$ includes indicator variables for the number of individuals in the household listed on the lottery sign up form (hereafter “household size”); although the state randomly sampled from individuals on the list, as mentioned above the entire household of any selected individual was then considered selected and eligible to apply for insurance. As a result, selected (treatment) individuals are disproportionately drawn from larger household sizes.\textsuperscript{16} For outcomes in the survey data, $X_{ih}$ also includes indicator variables for survey wave (and the interaction of these indicator variables with household size indicators) since the fraction of treatment individuals varies across the seven survey waves.\textsuperscript{17}

We denote by $V_{ih}$ a second set of covariates that can be included to potentially improve power by accounting for chance differences in variables between treatment and control group but that are not needed for $\beta_1$ to give an unbiased estimate of the relationship between winning the lottery and the outcome. There are three potential sources of such variables: the “lottery list” demographic variables; pre-randomization measures of outcomes in the credit report data and hospital discharge data; and the lottery draw to which the individual is assigned.\textsuperscript{18} Our analysis of survey data will not control for any $V_{ih}$ covariates; our analysis of administrative data will include lottery draw indicators as well as the pre-randomization measure for the outcome analyzed in the hospital and credit report data. Appendix 2.3

\textsuperscript{16}The proportion of treated (respectively, control) individuals in household size 1 is 66.5 (respectively, 83.6), in household size 2 is 33.1 (respectively, 16.4) and in household size 3 is 0.5 (respectively, 0.04). We do not study winning household members who were not on the original list; such individuals do not affect probability of selection and are not included in our measure of household size. Virtually all listed household members are adults since only individuals aged 19-64 are eligible for OHP Standard.

\textsuperscript{17}Our initial survey (conducted very shortly after the lottery began) included the treated individuals and an oversample of then-untreated individuals. Lower than expected take-up resulted in more draws than anticipated to reach the state’s enrollment target, and thus there was a higher treatment probability in earlier waves. We kept the wave assignments constant between this initial survey and the main survey conducted the following year.

\textsuperscript{18}In the administrative data, we measure outcomes from the notification date. For treatment individuals, notification date varies by lottery draw (which span a seven month period). For control individuals, we randomly assigned a lottery draw at the household level, stratified on household size, to match the distribution of lottery draws among the treatments so that, by construction, treatment probability is uncorrelated with lottery draw within household size.
shows that our results are not sensitive to other choices regarding the $V_{ih}$ covariates in either the survey or administrative data.

In all of our analyses we cluster the standard errors on the household identifier since the treatment is at the household level. Analyses of survey data are weighted to account for the sampling design of the survey as described above (and in Appendix 1.7).

4.1.2 Handling many outcomes: standardized treatment effects and multiple inference

We summarize multiple findings across related outcomes within a domain $J$ by the average standardized treatment effect:

$$\sum_{j \in J} \frac{1}{J} \frac{\xi_{ij}}{\sigma_j}$$

(2)

where $\sigma_j$ is the standard deviation of $y_j$ in the control group and $\xi_{ij}$ is the coefficient of interest for outcome $j$. (Specifically, for the reduced form in equation (1), the $\xi_{ij}$’s correspond to the $\beta_{ij}$’s in equation (1)).

In order to account for covariance in the estimates of $\xi_{ij}/\sigma_j$ we estimate pooled OLS for all outcomes $j \in J$. An important limitation of standardized treatment effects is that they implicitly “weight” each outcome within a domain equally, which may not be desirable.

In addition to standardized treatment effects, in each domain we also report the underlying estimates on the individual outcomes (i.e. the $\beta_{ij}$’s) due to their ease of interpretation, as well as their individual interest. For the individual outcomes we report both per comparison p-values and “family-wise” p-values adjusted to account for the multiple outcomes examined within the domain.

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20 To calculate the standard error on the standardized treatment effect we estimated pooled OLS (or pooled IV in the case of standardized treatment effects for the IV estimation discussed in Section 4.3) for all outcomes within the domain.

21 The family-wise p value corresponds to the probability of rejecting the null hypothesis of no effect on a given outcome under the null family of hypotheses of no effect on any outcome in this domain. We calculate these family-wise error rate adjusted p-values based on 10,000 iterations of the free step-down resampling method of Westfall and Young (1993). This is more powerful than a standard Bonferroni correction because it does not assume independence across the outcomes within a domain and sequentially removes hypotheses from the family after they are rejected; see Kling and Liebman (2004) or Anderson (2008) for more detailed discussions as well as applications.
specific outcome (such as depression). This adjusted p-value is more appropriate for considering the test
of the specific outcome as part of a set of tests on all the outcomes in the domain of that standardized
treatment effect (such as overall health). In practice, it is rare for one of our results to be statistically
significant (e.g. p value of less than 0.05) in the per-comparison test and not in the multiple inference
adjustment.

4.2 Validity of the experimental design

Our causal inference rests on the twin assumptions that assignment of the ability to apply for OHP
Standard was in fact randomized in the way described, and that the treatment and control individuals in
the sub-samples we use to analyze outcomes are not differentially selected from the full sample.

The lottery’s random selection process was performed by Oregon’s Department of Human Services
(DHS). We verified through independent computer simulations that we could replicate their procedure to
within sampling error(Appendix 2.1 and Table A12 provide more detail); we also demonstrate that the
procedure we used to draw our survey sample produced balance of treatment and control characteristics
(see Appendix 2.2).

Differences in attrition (match rates or response rates) or in the pre-randomization characteristics of
the treatment and control analysis samples would raise concerns about the key assumptions for causal
inference. Table 2 therefore investigates treatment-control balance for three different samples in columns
2 through 4, respectively: the sample universe (which is the sample analyzed in the hospital discharge

22 Needless to say, there is a fair degree of arbitrariness regarding what is grouped into the same standardized
treatment effect, and readers may legitimately prefer some more or less conservative adjustments. One extreme
would be adjustments that take account of all the outcomes analyzed, both in this paper and in any other (present or
future) paper about the study. In addition to being impractical, we do not feel that the null hypothesis of “no impact
of health insurance on anything” is a particularly useful one, and it would discourage investigation of effects that a
priori are considered unlikely. Another extreme would be to treat each outcome analyzed as an independent
hypothesis, and report only per-comparison (unadjusted) p-values. We also found this unappealing, since one might
feel very differently if, for example, only one of twenty closely related self-reported health measures had a per-
comparison p-value of less than 0.05. A virtue of our current grouping is that it was pre-specified in advance of
analysis.

^ In the archived analysis plan we proposed presenting standardized treatment effects of related outcomes within a
domain separately for both survey and administrative data, as well as a third standardized treatment effect using the
outcomes from both survey and administrative data in a given domain. Given the major substantive and
methodological differences between the two types of data, in this paper we have opted for reporting only the
standardized treatment effects across outcomes within domains for the survey and administrative data separately. In
practice this makes a negligible difference to the adjusted p-values; results available upon request.
data and the mortality data), the credit report subsample, and the survey respondents. A priori we were most concerned about the potential for imbalance between treatment and controls in the subsample of survey respondents, given the 50 percent non-response rate (compared to an effective match rate of over 97 percent in the credit report data).23

Panel A shows the balance of match rates. In the credit report data, the difference in (unconditional) match rates between treatment and control is a statistically insignificant 0.4 percentage points. In the survey respondent sample, there is a statistically significant 1.6 percentage point (standard error = 0.7) lower response rate for treated individuals, off of a 51 percent base.24 By way of comparison, our estimated difference in response rates across treatment and control is much smaller than in the RAND Health Insurance Experiment; there, the overall response rate was higher (77 percent), but those randomized into more coverage had systematically higher response rates, with a 24 percentage point difference in response rate between the most and least comprehensive plan (87 percent versus 63 percent; Newhouse et al., 1993).

Among the matched or responding subsample, Panel B reports the treatment-control balance for various pre-randomization characteristics. The first row (“lottery list characteristics”) shows the F-statistics and p-values on the treatment-control balance of all the nine lottery list demographics. The second row (“pre-randomization outcomes”) shows the balance of pre-randomization outcomes that match ones that we subsequently analyze post-randomization. The number and definition of these outcomes varies according to the sample studied.25 Finally, the third row (“both of the above”) examines balance on the lottery list and pre-randomization outcomes combined. In each of the three samples we are

24 Conditional on response, response time between treatment and controls is indistinguishable.
25 For the hospital sample we examine 12 pre-randomization hospital outcomes measured on average for 5 months prior to the lottery. For the credit report sample we examine 10 pre-randomization credit report outcomes measured from February 2008 (the month before the lottery began) and with the same approximately 16 month look-back period as the post-randomization measures. For the survey sample we have no pre-randomization survey measures but we selected four pre-randomization measures from the credit report and hospital discharge data that are similar to subsequent survey measures. The selection of all these variables was pre-specified and is described in more detail in Appendix 2.2, where we also present treatment-control differences for each individual variable analyzed.
unable to reject the null of treatment-control balance on the lottery list variables, the pre-randomization measures, or the combined set of variables. All p-values are above 0.23. For the survey respondent subsample – where a priori we were most concerned about potential imbalance – the p-values are all at least 0.28.\textsuperscript{26}

A separate question from the balance of treatment and controls within a subsample is how the various subsamples compare to each other. Differences in characteristics across sub-samples do not threaten causal inference, but may be important for comparing estimates across data sets as well as for extrapolating to other contexts. Appendix Table A1 shows that survey respondents are on average almost two years older and about 3 percentage points more likely to be female than the full sample. There are no obvious observable differences between the credit report subsample and the full sample.

4.3 IV

The reduced form (or intent-to-treat) estimates from equation (1) provide an estimate of the causal effect of winning the lottery (i.e. winning the ability to apply for OHP Standard). This provides an estimate of the net impact of expanding access to public health insurance. We are also interested in the impact of insurance coverage. This is modeled as follows:

\[ y_{ihj} = \pi_0 + \pi_1 INSURANCE_{ih} + X_{ih} \pi_2 + V_{ih} \pi_3 + \nu_{ihj} \tag{3} \]

where INSURANCE is a measure of insurance coverage and all other variables are as defined in equation (1). We estimate equation (3) by two stage least squares (2SLS), using the following first stage equation:

\[ INSURANCE_{ihj} = \delta_0 + \delta_1 LOTTERY_{ih} + X_{ihj} \delta_2 + V_{ihj} \delta_3 + \mu_{ihj} \tag{4} \]

\textsuperscript{26} Another potential way to examine non-response bias in the survey data could be to investigate whether the estimated impact of insurance on outcomes in the administrative data differs for survey responders compared to survey non-responders. Our concern with this approach is that it could confound potential non-response bias with potential heterogeneity in treatment effects across responders and non-responders, so that observed differences (or lack thereof) do not have clear implications for the presence of non-response bias. For this reason our analysis plan specified only the differences in pre-randomization measures presented here for investigating potential non-response bias. In practice, our subsequent attempt to also compare the estimates of the impact of insurance on later outcomes in the administrative data for survey responders and non-responders yielded estimates that were too imprecise to be informative.
in which the excluded instrument is the variable LOTTERY with the first stage coefficient of $\delta_1$.

Because the model is just identified, the 2SLS estimate of $\pi_1$ is given by the ratio of the reduced form (equation 1) and first stage (equation 4) coefficients ($\beta_1 / \delta_1$). We interpret the 2SLS estimates as a local average treatment effect or LATE. (Imbens and Angrist, 1994). In other words, the 2SLS estimate of $\pi_1$ identifies the causal impact of insurance among the subset of individuals who would obtain insurance on winning the lottery and would not obtain insurance without winning the lottery (i.e. the compliers). Table 3 reports our first stage estimates based on estimation of equation (4). The first row reports the estimates for the measure of insurance that is used in all of our IV estimates: whether the individual was ever on Medicaid (which includes both OHP Standard and OHP Plus) during our study period, as measured by the state’s Medicaid enrollment files. The results indicate a first stage of 0.26 for both the full sample (column 2) and the credit-report subsample (column 4) and a first stage of 0.29 for the survey respondents (column 6). All of these first stages have F-statistics above 500. The first stage coefficient is considerably less than 1, primarily reflecting the 30 percent take-up discussed above; in addition, a small percentage of the controls became eligible for OHP Plus over our study period. Relative to our study population, compliers are somewhat older, more likely white, in worse health, and in lower socio-economic status (see Appendix table A23).

The subsequent rows of Table 3 report first stage estimates for alternative definitions of insurance. We focus the discussion on the results for the full sample (column 2); the other samples show very similar

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27 When we report standardized treatment effects for IV estimates, they are calculated based on the formula in equation (2) and using pooled IV estimates of equation (3) across outcomes.
28 For purposes of measuring the first stage, the study period is defined as ending on September 30, 2009. For the administrative data the study period begins with the notification date (which varies by lottery draw). For the survey data the study period is defined from the first notification date (i.e. March 10, 2008), since within survey wave the notification date varies. Although the average response date to the survey was September 23, 2009, about 35 percent of our weighted responses occur after this, in large part because of the intensive follow-up timing which continued in some cases till as late as March 2010 (see Appendix 1.7). Defining the study period differently for individuals based on their response date makes little difference for our estimated first stage estimates. This can be seen by comparing the first stage estimates for survey respondents in row 8 of Table 3 (where insurance is defined as covered by Medicaid on the date closest to the survey response date) and row 4 of Table 3 (where insurance is defined as covered by Medicaid as of September 30, 2009); the estimated first stages among survey respondents are 0.18 and 0.19 respectively.
29 As we discuss in more detail in the data Appendix 1.3, the way the state identifies lottery participants in the Medicaid enrollment files may cause it to slightly under-estimate enrollment among non-selected (control) individuals, and thus cause us to over-estimate our first stage by, we estimate, 2 percentage points or less.
patterns. Not surprisingly, the results in row 2 show that estimated first stage is virtually the same if we examine only coverage by OHP Standard (the program directly affected by the lottery) versus coverage by either public program, indicating that selection by the lottery is not associated with an increase in coverage by OHP Plus. Row 3 shows that on average the lottery is associated with an increase of 3.4 months with Medicaid.

Over time the difference in insurance coverage between treatment and controls attenuates as enrolled individuals had to recertify their eligibility every 6 months and control individuals could find other insurance (particularly OHP Plus); this can be seen clearly in Appendix Figure A3. As a result, when the dependent variable is defined as “on Medicaid at the end of the study period” rather than our primary measure of “ever on Medicaid” the estimated first stage declines from 0.26 (row 1) to 0.15 (row 4).

The survey data (column 4) provide a broader measure of insurance coverage than available in the Medicaid administrative data. The results in row 5 indicate that the estimated increase in self-reported “any” insurance coverage is very similar (within two percentage points) to the estimated increase in self-reported Medicaid coverage (row 7). Consistent with this, row 6 indicates a decline in self reports of private insurance coverage of only 0.8 percentage points (standard error =0.5). The estimated increase in Medicaid coverage as reported in the survey and as measured in the administrative data are quite similar when measured over the same time horizon (compare rows 7 and 8).

The identifying assumption behind the 2SLS estimates is that there is no effect on the outcomes studied, on average, of winning the lottery that does not operate via the lottery’s impact on insurance coverage. We believe this is a reasonable approximation, but may not be strictly true. There are (at least) two possible types of violations. First, it is possible that the event of winning (or losing) the lottery may have direct effects on the outcomes we study, although it seems unlikely to us that such effects both exist and would persist for a year after the lottery.\textsuperscript{30} Second, individuals who apply for public health insurance

\textsuperscript{30} In much of the literature on public health insurance, there is a notion of a potential “option value” of public health insurance among those who are eligible but not covered since they may choose to take up that coverage if and when it becomes needed (see e.g. Cutler and Gruber (1996) who refer to such individuals as “conditionally covered”).
may also be encouraged to apply for other public programs for which they are eligible, such as food stamps or cash welfare. In particular, if the individual applied for OHP in person (rather than by mail) case workers were instructed to offer assistance to the applicant (if they were interested) in also applying for TANF (cash welfare), the Supplemental Nutrition Assistance Program (more commonly known as food stamps), and employment related child care assistance. These other cash (or cash equivalent) transfer programs could have direct effects on the outcomes we study. This is not an idiosyncratic feature of our setting but a more general feature of the application process for public programs; as such, it may be a relevant component of the impact of attempts to expand Medicaid more generally. However, any direct impact of winning the lottery on receipt of other benefits is a violation of the exclusion restriction for the IV interpretation of the impact of insurance per se, as opposed to the effect of expanded access to Medicaid (the reduced form).

The results in Table 3 suggest that there is a statistically significant but substantively trivial impact of the treatment (lottery selection) on other program receipt. Rows 9 and 10 of Table 3 indicate that selection by the lottery is associated with a statistically significant increase in the probability of food stamp receipt of 1.7 percentage points and of total food stamp benefits over about $60 over a 16 month period, or less than 0.5 percent of annual income.\(^{31}\) Estimates of the income elasticity of health care use range from a low end of about 0 to a high end of about 1.5 (Getzen 2000, Table 1), suggesting that the income effect of food stamp receipt on health care use would be considerably less than 1 percent. The impact on health seems likely to be negligible as well.\(^{32}\)

\(^{31}\) This is likely an upper estimate since the cash equivalent of food stamps may be less than one (Hoynes and Schanzenbach 2009). Moreover, some of the increase in food stamp benefits could reflect an impact of insurance, rather than of insurance application. Consistent with this, the estimated impact of lottery selection on food stamp receipt grows over time; for example, in the first three months after lottery selection (which is more plausibly a time frame during which one would see direct effects of selection on other program receipt) the impact of lottery on food stamp receipt and food stamp benefits is only 0.4 percentage points (standard error =0.3) and $3.6 (standard error = 2.5) respectively (not shown).

\(^{32}\) We have not yet been able to obtain data on receipt of TANF or employment related child care assistance. However TANF receipt qualifies the individual for OHP Plus and our estimates suggest that the lottery is associated with about a 0.3 percentage point increase in OHP Plus (statistically significant in some samples) which suggests the
5. RESULTS

5.1 Health care utilization

5.1.1 Administrative data

Table 4 presents our primary estimates using the hospital discharge data; all analyses exclude admissions for childbirth. Table 4a reports results on the extensive margin (i.e. admission probabilities). The two stage least squares results suggest that insurance is associated with an increase in the probability of any hospital admission of 2.1 percentage points (standard error = 0.7), or about 30 percent. The increase in hospital admissions appears to be disproportionately concentrated in the approximately 35 percent of admissions that do not originate in the emergency room, suggesting that these admissions may be more price sensitive.

Table 4b examines three measures of total utilization commonly used in the literature (see e.g. Card et al., 2009): number of hospital days, total list charges, and number of procedures performed. Although total utilization is arguably of greater interest (particularly for estimating the impact on total costs), not surprisingly – given the skewed right tail of total utilization – we have less statistical precision here than on the extensive margin. The 2SLS estimates in Panel A show substantial increases in each of the three measures of utilization – with implied proportional increases of about 20 percent for hospital days. The lottery did not have a substantive impact on TANF receipt. The child care assistance program is considerably smaller than the other two.

33 More detail on variable definitions and descriptive statistics for the outcomes analyzed here can be found in Appendix 1.

34 Regardless of lottery selection, many women in our sample would become categorically eligible for OHP Plus for childbirth.

35 List charges are accounting charges for rooms and procedures and do not reflect transacted prices. They are perhaps best viewed as a price-weighted summary of treatment, albeit at somewhat artificial prices (Card et al., 2009).

36 Given the skewed nature of these outcomes (see Appendix Table A3) we also estimated proportional models which we report in Appendix Table A15. The results based on a proportional model are qualitatively similar to the linear estimates in suggesting increases in all three measures and the implied proportional effects of the linear reduced form are roughly similar in magnitude to the proportional estimates. The proportional estimates also suffer from a lack of precision.

37 The estimated increase in total days (0.1), while imprecise, is consistent with the estimated increase on the extensive margin. Given an average number of days (conditional on any admission) of 7.4 over our study period (see Table A3), the results on the extensive margin imply that, if the marginal admit had this average expected number of days, we would expect to see an increase in days of 0.16 (=0.021*7.4). This is well within the 95 percent confidence
percent for list charges, and 45 percent for the number of procedures, although only the result for procedures is statistically significant at the 10 percent level. The standardized treatment effect across all three measures indicates that insurance is associated with a 0.047 of a standard deviation increase in overall utilization (standard error = 0.026); the relatively small standardized effect in part reflects the large variance of the underlying variables.

We undertook several additional investigations, which are presented in detail in Appendix 3.1. First, we examined hospital utilization for seven conditions of interest and of reasonably high prevalence in our population: heart disease, diabetes, skin infections, mental disorders, alcohol and substance abuse, back problems, and pneumonia. We found a statistically significant increase in utilization (both extensive and total) only for heart disease. We also explored the impact of health insurance on the quality of outpatient care (admissions for ambulatory care sensitive conditions) and three measures of quality of care for inpatient care (not having an adverse patient safety event, not being readmitted within 30 days of discharge, and quality of hospital). We were unable to reject the null of no effects on either outpatient or inpatient quality, although our confidence intervals are extremely wide and do not allow us to rule out quantitatively large effects. Finally, we examined whether insurance was associated with a change in the proportion of patients going to public vs. private hospitals and were unable to detect any substantive or statistically significant differences.

5.1.2 Survey data

The survey data allow us to examine a broader range of utilization outcomes. Table 5 shows the results. Once again, we present results on both the extensive margin (left-hand panel) and on total utilization (right-hand panel). On both margins there are substantial and (mostly) statistically significant increases in prescription drugs and outpatient use. For example, the two stage least squares estimates suggest that insurance is associated with a 0.35 (standard error = 0.18) increase in the number of prescription drugs currently taken (corresponding to an approximately 15 percent increase) and a 1.08 interval of the point estimate of a 0.1 increase (standard error = 0.1) in the number of days; moreover, the marginal admit might be expected to have a shorter length of stay. Calculations are similar for admissions that do and do not originate through the emergency room.
(standard error = 0.18) increase in the number of outpatient visits (corresponding to an over 55 percent increase). The responses on the extensive margin may account for a large share of the increase in total utilization, although some of the increase in outpatient utilization – and perhaps in total drug utilization – likely reflects increased use among existing users (i.e. on the intensive margin). There is no discernible impact of insurance on emergency room or inpatient hospital use on either margin, although the confidence intervals do not allow us to rule out potentially large effects and are consistent with the findings on hospital utilization from the administrative data.

Overall, across the four utilization measures, we estimate that insurance is associated with a statistically significant increase in total utilization of 0.14 standard deviation, and in any utilization of 0.17 standard deviation. Since the four different components of utilization have very different expected costs, in the bottom row of Table 5 we make a back-of-the-envelope calculation of the increase in annual spending associated with insurance by weighting each type of utilization by its average cost among low-income publicly insured adults in the MEPS. This back-of-the-envelope calculation suggests that insurance is associated with a $778 (standard error = $371) increase in annual spending, or about a 25 percent increase relative to the implied control mean annual spending.

Although the longer-run impact of health insurance on health care utilization may differ from the one-year effects, we do not believe our one year estimates are capturing an initial, highly transitory surge of “pent up demand” for health care among the uninsured. In the survey, conducted about 13 months after

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38 The average number of drugs taken among control individuals who use drugs is 3.6, and the average number of outpatient visits among those with any is 3.2 (see Appendix 1.7, Table A11). If the marginal user on the extensive margin has utilization equal to the average among those who use, the response on the extensive margin would imply a total increase in drug use that is about 90 percent of what we estimate, and a total increase in outpatient visits that is about 60 percent of what we estimate. In fact, the marginal user probably uses less than average.

39 To mimic the survey variables, we constructed measures in the discharge data of “any hospital visit in the last six months” and “number of hospital visits in the last six months”, each defined for the six months prior to the individual’s survey response date. For “any visit in the last six months”, the reduced form estimate in the discharge data is 0.0015 (standard error = 0.0023), compared to 0.0022 (standard error = 0.0040) in the survey data; for “number of visits in the last six months” the reduced form estimate in the discharge data is 0.0025 (standard error = 0.0034) compared to 0.0062 (standard error = 0.0062) in the survey data. Interestingly, self reports do tend to overstate inpatient hospital use on average. The average for the controls of “any visit in the last six months” is 0.07 in the survey compared to 0.03 in the discharge data; for “number of visits in the last six months” these numbers are 0.10 and 0.03 respectively. There is not however, any difference in “reporting error” between treatments and controls.
insurance coverage began, all of the questions ask about current utilization or utilization over the last six months, not about utilization right after insurance began. Moreover, the evidence in Table 11 below from the survey conducted about 6 months after insurance began (so that a six month look back period likely captures the initial effects of insurance) shows no evidence of a larger initial utilization effect, suggesting that such “pent up” demand effects may not in fact be present.

Table 6 suggests insurance is also associated with an increase in compliance with recommended preventive care. We look at four different measures of preventive care: blood cholesterol checks, blood tests for diabetes, mammograms, and pap tests. Overall, the results indicate a 0.3 standard deviation (standard error = 0.04)) increase in the probability of getting recommended preventive care. This reflects statistically significant increases in all four of the measures examined, including a 20 percent increase in the probability of ever having one’s blood cholesterol checked, a 15 percent increase in the probability of ever having one’s blood tested for high blood sugar or diabetes, a 60 percent increase in the probability of having a mammogram within the last year (for women 40 and over), and a 45 percent change in the probability of having a pap test within the last year (for women).

5.2 Financial strain

5.2.1 Administrative data

Table 7, Panel A, analyzes five measures of financial strain in the credit report data: whether the individual has had a bankruptcy, a lien, a judgment, a collection, or any credit account with a payment that is 30 days or more late (“a delinquency”). Broadly speaking, all are measures of unpaid bills or outstanding obligations that are likely to have a major negative impact on one’s access to credit, at least in a general population (Avery et al, 2003). As the frequencies in Table 7 indicate, bankruptcies, judgments

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40 Our survey only distinguishes between preventive care received within the last year and that received more than a year ago. See Appendix 1.7 (and Figure A4) for detail. For blood cholesterol and diabetes checks we look at whether one has “ever” had these because the recommendation is to do it every 3 to 5 years (and our analysis is over an approximately one year horizon). For pap tests and mammograms we look within the last year since the recommendation at the time of the study was for these to occur annually, and we look only within the relevant populations (women, and women over 40 respectively).

41 Delinquencies are mechanically zero for the one quarter of our sample who has no open credit over our study period.
and liens capture relatively extreme “right tail” events (ranging from 1 to 6 percent frequency over our
16-month sample period), while collections and delinquencies are much more common (about 50 percent
and 37 percent frequency, respectively).\(^{42}\)

The average standardized treatment effect suggests no evidence of a decline in financial strain across
all these measures; the point estimate is of a statistically insignificant increase in financial strain
associated with health insurance of 0.009 standard deviations (standard error = 0.019). Four of the five
measures show no significant change. However there is evidence that health insurance is associated with a
decline in the probably of having any unpaid bills sent to collection of 4.8 percentage points (standard
error = 0.016), or about 10 percent relative to the control mean. This result is highly statistically
significant, even after adjusting for multiple tests. One reason that we may see a decline in collections but
not in the other measures is that a collection is less of a “right tail” event and occurs with less of a lag
following an unpaid bill than a judgment, lien or bankruptcy.\(^{43}\) Another possibility is that there is more of
an impact of health insurance on collections since, both in our population and in the general population,
collections are disproportionately medical.\(^{44}\)

We are able to decompose the presence and size of collections into medical (Panel B) and non-
medical (Panel C) components; this decomposition is not feasible for the other measures. The decline in
overall collections shown in Panel A is primarily (or perhaps entirely) driven by a decline in medical
collections. We find declines in both the existence and magnitude of medical collections. For example,
health insurance is associated with a decline in the probability of having medical collections of 6.4

\(^{42}\) With the exception of the bankruptcy rate which is about the same in the general Oregon population, all of the
measures of financial strain are about two to four times more common in our study population than in the general
Oregon population (see Appendix Table A8).  
\(^{43}\) For example, discussions with hospitals in Oregon suggest that it will take about 3 to 4 months before an unpaid
hospital bill is sent to a collection agency. Similarly it will take time to decide to seek a judgment and then to win a
judgment. Therefore while we analyze data through September 2009, our measures may not fully capture the
financial strain incurred through that end date.  
\(^{44}\) In a general population, collections for medical bills are the single most common kind of collection, followed by
utility bills (Avery et al., 2003). In our study population over our study period, about 28 percent of our sample has a
medical collection, and about 39 percent has a non-medical collection; on average in our sample, the unconditional
amount owed in collections is about $2,000 for medical collections and $2,700 for non-medical collections. It is
possible that some “non-medical” collections may also reflect medical debt (for example, if one charges one’s
medical bills to a credit card and then does not pay the credit card bill and the credit card company tries to collect).
percentage points (standard error = 1.6), or about 25 percent relative to the control mean, and a decline in the average (unconditional) amount owed in medical collections of $390 (standard error = $177), or about 20 percent relative to the control mean. The corresponding estimates for non-medical collections are substantially smaller and statistically insignificant.

These results are subject to some potential limitations, discussed in more detail in the Appendices. First, not all collections are reported to the credit bureaus, although our investigations did not suggest any reason to suspect reporting to be correlated with insurance status (See Appendix 1.6). Second, in theory health insurance might affect access to revolving credit itself, which could complicate interpretation of measures of financial strain based on late payments for revolving credit (i.e. delinquencies); however we found no evidence of effects on access to credit (Appendix 3.2). Third, many of the measures capture only right tail events and with a substantial lag. Last, credit reports do not capture the use of informal or “non-traditional” credit sources – which may be particularly important in a low-income population. \(^{45}\) Given these limitations, the survey measures of financial strain are a useful complement to the credit report measures.

5.2.2 Survey data

Table 8 reports results for four measures of financial strain: whether the respondent has any out-of-pocket medical expenditures in the last six months, whether the respondent currently owes money for medical expenses, whether the respondent had to borrow money (or skip paying other bills or pay them late) to pay medical expenses in the last six months, and whether the respondent has been refused medical treatment because of medical debt in the last six months. We find a statistically significant decline in all four survey measures of financial strain, including, for example, a 20 percentage point (35 percent) decline in the probability of having out of pocket expenses and a 15 percentage point (40 percent) decline.

\(^{45}\) For example, in the 2007 Survey of Consumer Finances, of individuals who report having any debt (which is about three-quarters of the total population but only about half of those below the poverty level), about 10 percent of the debt of those below the poverty level is owed to “individual lenders” (e.g. relatives and friends) which would not be captured in credit reports, compared to only 3 percent of the debt in the overall population (authors’ calculations).
in the probability of having to borrow money or skip paying other bills to pay medical expenses. 46 The average standardized treatment effect indicates that insurance is associated with a 0.3 standard deviation (standard error = 0.035) decline in these measures of financial strain.

The results suggest that the financial incidence of Medicaid coverage is on both the newly insured and their medical providers. The declines in out of pocket expenses and in reported difficulty paying non medical bills point to direct financial benefits to the newly insured. At the same time, both the survey data indicating a reduction in unpaid medical bills and the credit report data indicating a reduction in medical collections point to increased revenue for providers, since a large share of medical debt is never paid. 47

For risk averse consumers, the largest welfare gains from any consumption-smoothing effects of insurance come from reducing extreme negative shocks to consumption. Although we cannot measure consumption directly, following Finkelstein and McKnight (2008) we estimate quantile regression models of the reduced form equation (1) to examine the impact of health insurance on the quantiles of the distribution of out-of-pocket medical expenditures. As expected given the comprehensive nature of Medicaid coverage, Figures 1a and 1b indicate that selection by the lottery is associated with declines in out-of-pocket spending at all the (non-zero) quantiles of the distribution. The same appears true for self-reported medical liabilities (Figures 2a and 2b), and the decline in medical collections is particularly concentrated in the right tails of the distribution (Figures 3a and 3b).

46 These results imply that about 35 percent of those covered by OHP still have out-of-pocket medical expenses. The control group reports, on average, $307 in semi-annual out of pocket medical expenses; the IV estimate of the impact of insurance on these expenses is -122 (standard error = 43), implying that those covered by OHP average $185 in semi-annual out of pocket medical expenses. Our casual impression from focus groups is that these reflect some combination of continued scheduled payments on prior debts, uncovered services (primary dental), reporting of monthly premiums as out-of-pocket medical expenses, and perhaps including travel costs to the medical provider. It is also possible that some individuals report out of pocket medical spending for other family members (even though the question directed individuals to report only expenditures on themselves). Gross and Notowidigdo (2011) similarly find evidence of reported out of pocket spending on Medicaid recipients in the Medical Expenditure Panel Survey.

47 In our population we estimate that less than 2 percent of medical collections are ultimately paid. Because collections may be paid with as substantial lag, we computed this statistic by looking at collections that originated between 2005 and 2007 and tracking whether they were paid by the end of September 2009. Across all types of collections, we similarly estimate that about 3 percent are paid. Avery et al (2003) estimate, for a general population, that about 11 percent of medical collections are paid off.
5.3 Health

Table 9 shows our estimates of the impact of health insurance on health. We have one measure of health from administrative data, namely mortality, which we measure from the notification date through September 30th, 2009. Mortality – although important and objectively measured – is very low in our population; only about 0.8 percent of the controls die over the 16 month study period. Not surprisingly, Panel A shows that we do not detect any statistically significant improvement in survival probability.

Panel B analyzes seven different measures of self-reported health from the survey data. The first two use the question about self-reported health (fair, poor, good, very good, or excellent) to construct two binary measures: (1) self-reported health good, very good or excellent (55 percent of the population) and, (2) to examine “tail” behavior, self-reported health not poor (i.e. 86 percent of the population). The other measures are: (3) whether self-reported health status is about the same or gotten better over last six months (vs. gotten worse), (4) the number of days in good physical health in last month (0-30), (5) the number of days not impaired by physical or mental health in the last month (0-30), (6) the number of days in good mental health in the last month (0-30), and (7) whether the respondent screened negative for depression. Many of these measures capture both physical and mental health; the last two, however, capture only mental health.

The results in Panel B indicate that insurance is associated with statistically significant improvements in each of the seven measures. On average, our results suggest that health insurance is associated with a 0.2 standard deviation improvement in self-reported health (standard error = 0.04). This includes, among other things, an increase in the probability of screening negative for depression of 7.8 percentage points (standard error = 2.5) or about 10 percent relative to the control mean, and an increase in the probability of reporting one’s health as good, very good, or excellent of 13 percentage points (standard error = 2.6), or about 25 percent relative to the control mean.

There is thus an overwhelming sense from the survey outcomes that individuals feel better about their health and, as we come to below, their interactions with the health care system. Given the subjective nature of the responses, it is more difficult to judge with the available data whether the results reflect...
improvements in actual, physical health. For mental health, the self-reported and subjective nature of the questions is less of an issue, since diagnosis of depression, by its nature, relies on such self-reports; the depression screen we use correlates highly with clinical diagnoses of depression (Kroenke et al., 2003). However, the self-reported physical health measures could reflect a more general sense of improved well-being rather than actual improvements in objective health. (A priori we were concerned that by increasing contact with the health care system, health insurance would cause individuals to learn more about their health problems (e.g. a doctor would tell a person who had not known it that they diabetes or high blood pressure) and thus could cause them to report themselves to be in worse health; to the extent this happens, it does not outweigh effects in the opposite direction.)

There is evidence of several mechanisms by which health insurance could have improved objective, physical health. Besides the previously documented increase in health care utilization and compliance with recommended preventive care, the survey data also indicate that insurance is associated with statistically significant increased self-reported access to care (Table 10, Panel A) and perceived quality of care (conditional on receipt) (Table 10, Panel B). 48

However, there is also evidence that a substantial part of the estimated improvements in self-reported physical health may reflect a general sense of improved well-being. In particular, Table 11 compares reduced form estimates from our main survey to reduced form estimates from the initial survey which we fielded on average about 2.6 months after random assignment and about 1 month after coverage was approved. ^ As we would expect given this timing, there is no evidence of an increase in health care utilization in this earlier survey. However, there is evidence of an improvement in self-reported health of about two-thirds the magnitude of our main survey estimates from more than a year later; this reflects statistically significant improvements in all of the individual health measures available in the initial

48 We also examined the impact of health insurance on two “health behaviors” (smoking and a possible measure of exercise). We present these results in Appendix 3.3; their interpretation is not obvious. We find no evidence of a decline in the probability of smoking and while we find a substantial and statistically significant increase in the probability of reporting that one is more physically active compared to others one’s age, it is difficult to know whether to interpret this as an increase in health-promoting behavior or in health.

^ This analysis was not pre-specified.
survey (all those in the main survey except the depression screen). Given the limited time after coverage approval and the lack of any increase in health care utilization, it seems likely that this immediate improvement does not reflect changes in objective physical health. Likewise, self-reported access to care also shows a statistically significant improvement in the initial survey (despite no evidence of an increase in utilization) of about 40 percent the magnitude of the later survey, which again seems more likely to reflect an improved outlook. Of course, it is also possible that some of these immediate improvements reflect “winning” effects that are less likely to be picked up in the estimates one year later.

Consistent with an improved overall sense of well-being, there is evidence in the later survey of a substantial (32 percent) increase in self-reported overall happiness (Table 10, Panel C). It is, of course, difficult to know how much of the self-reported happiness improvement reflects feeling better about one’s health, just as it is difficult to know how much of the self-reported health improvement reflects more general improvement in a sense of well being. Overall, the evidence suggests that people feel better off due to insurance, but with the current data it is difficult to determine the fundamental drivers of this improvement.

6. DISCUSSION: INTERPRETING AND EXTRAPOLATING THE RESULTS

Using a randomized controlled experiment design, we examined the approximately one year impact of extending access to Medicaid among a low-income, uninsured adult population. We found evidence of increases in hospital, outpatient, and drug utilization, increases in compliance with recommended preventive care, and declines in exposure to substantial out-of-pocket medical expenses and medical debts. There is also evidence of improvement in self-reported mental and physical health measures, perceived access to and quality of care, and overall wellbeing.

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49 There is also evidence of a decline in financial strain in the initial survey that is about 40 percent the magnitude of the analogous measures in the later survey. This seems sensible when one recalls (see Section 3.4) that for an individual who successfully obtained insurance through the lottery, coverage was applied retroactively to about one month prior to the approval date. Individuals in the initial survey had therefore been covered retroactively by about 2 months, or about one-third of the six-month look back period on the financial strain questions. In other words, individuals may not have changed their health care utilization behavior in any detectable way after only 1 months of coverage (out of the last 6), but the retroactive coverage for 2 months (of the last six) has had an impact on their finances.
These results speak to the approximately one-year impact of expanding Medicaid access. As discussed earlier, we do not believe the results reflect a transitorily large utilization response stemming from initial “pent up demand”. However the results may be larger than what we would find if individuals were not at risk of losing their insurance (and being unable to re-apply for it) if they do not continue to meet the eligibility requirements. The effects of health insurance may also change over longer horizons. At approximately two years after random assignment, we conducted in-person interviews and health examinations on a subsample of our study population located in the Portland metropolitan area. Results from those data should help shed light both on the longer-run impacts of insurance coverage, and on the impact of insurance on more objective measures of physical health, including biometric measures.

One natural way to try to interpret the current results is via a cost-benefit analysis. One could compare the cost of public funds from Medicaid expenditures on the newly insured as well as the moral hazard cost of increased utilization to the benefits from reduced financial strain and from improved self-reported health. However monetizing the costs, and especially the benefits, would require – and likely would be quite sensitive to – a number of assumptions; we consider this beyond the scope of the current paper. Instead, to help put our results – particularly their magnitudes – in context, in the remainder of this section we compare the results to what we would have obtained from observational estimates in this setting, and to the existing experimental and quasi-experimental estimates from other settings. We also comment on some issues in trying to extrapolate from our results to the likely impact of health insurance in other contexts.

### 6.1 Comparison to observational estimates

We take several complementary approaches to compare our experimental estimates to what we might have estimated using observational data. In Table 12 we compare differences in outcomes within our study population across individuals who differ in their insurance coverage. The first column replicates our previous IV estimates using the lottery as an instrument for insurance coverage, and the remaining

---

50 An interesting issue that any cost-benefit analysis will have to grapple with is how to monetize any generalized improvements in overall well-being that are not directly tied to mental or physical health improvements but that our results suggest may be among the most important benefits of health insurance.
columns present various OLS comparisons of people with and without insurance within our full study population (column 2), our control group (column 3), and our treatment group (column 4); unlike our IV estimates, these OLS comparisons will capture the effect of endogenous take-up of Medicaid, which can include a medical provider’s qualifying a person for coverage at the time they seek care. To provide observational estimates of the impact of insurance coverage from outside of our data, Table 13 analyzes survey data from the Behavioral Risk Factors Surveillance Study (BRFSS) and the National Health Interview Study (NHIS) for outcome measures that are identical or very comparable to those collected by our survey. We compare the outcomes for insured vs. uninsured adults aged 19 – 64 with income below 100 percent of poverty in the national surveys both without controls (column 2) and with a rich set of demographic controls (column 3).

We find marked differences between our experimental estimates and our attempts to approximate their observational analogs in Tables 12 and 13. There is a general pattern of larger estimated impacts of health insurance on health care utilization in the observational estimates relative to the experimental ones, and of opposite signed impacts of health insurance on health, with health insurance appearing to worsen health in the observational estimates. These differences suggest that, at least within a low-income population, individuals select health insurance coverage are in poorer health (and therefore demand more medical care), than those who are uninsured, as standard adverse selection theory would predict. The results also suggest that the OLS estimates of the reduction in financial strain caused by health insurance are lower than the IV estimates, suggesting that, within a low-income population, the insured are generally poorer than the uninsured; that may reflect the income eligibility ceilings for public health insurance.

6.2 Comparisons to existing experimental and quasi-experimental estimates

We also try to place our estimates broadly in the context of the existing experimental and quasi-experimental estimates, although naturally there are no strictly comparable estimates. The only other randomized experiment (the RAND) took place over 30 years ago and involved variation in generosity of coverage among the insured (rather than variation on the extensive margin) in a representative population;
due to the available variation, most of the quasi-experimental studies have focused on the elderly or on the young rather than on prime age adults (as our study does).

With these caveats in mind, our loose sense is that the magnitude of our experimental estimates of the impact of moving low-income adults from no insurance to Medicaid coverage on health care utilization, while large in absolute terms, may, if anything, be slightly smaller than existing estimates might have suggested. For example, the RAND experiment from the 1970s – which experimentally varied the generosity of coverage in a representative population under age 65 – found that moving from the least comprehensive insurance plan – which still offered considerable insurance coverage (with an average out-of-pocket expenditure share of about 30 percent and a frequently binding out-of-pocket maximum) – to full insurance (“free care”) was associated with a 45 percent increase in annual spending, while our back-of-the-envelope calculation suggested that Medicaid was associated with a 25 percent increase in six month spending. The same insurance variation in RAND, which is much smaller than the variation we observe, also produced about a 75 percent increase in the number of annual outpatient visits, while we estimate that Medicaid is associated with about a 55 percent increase in the number of semi-annual outpatient visits. For hospital admissions, both studies find about a 30 percent increase in the probability of a hospital admission over approximately one year.51 More recent quasi-experimental work suggests that Medicare coverage is associated with about a 10 percent increase in the annual probability of admission for 65 year olds; this appears to reflect some combination of the 10 percentage point increase in insurance coverage associated with Medicare as well as the increase in total insurance coverage among the previously insured (Card et al., 2008).52

Most quasi-experimental estimates of the impact of health insurance on health have focused on mortality as an objective and readily available – if incomplete – measure of health. Yet mortality is a particularly poor measure for a prime age adult population, given the very low baseline mortality rate; as

51 RAND estimates are from Newhouse et al. (1993) page 41.
52 Like us, recent regression discontinuity estimates of the impact of “aging” onto insurance at 65 (Card et al., 2008) or off of it at 19 (Anderson et al., 2010) find that the impact of insurance on hospital admissions is disproportionately concentrated in admissions that do not come through the emergency room.
noted, most quasi-experimental estimates focus on the young or the old, rather than prime age adults. Like us, the RAND Experiment found no evidence of an impact of insurance on adult mortality (Newhouse et al., 1993 page 211).

Our findings regarding the impact of Medicaid on self-reported health may be larger than what might have been expected based on the (few) existing experimental and quasi-experimental estimates. RAND found no evidence of an impact of insurance generosity on adult self-reported general health or adult mental health (Newhouse et al., page 209); by contrast, our estimates suggested that the move from no insurance to Medicaid produced large (approximately two tenths of a standard deviation) improvements in adult self-reported general health, including an approximately 10 percent decline in the probability of a positive depression screen (see Table 9). For a somewhat older population – those aging onto Medicare at age 65 – quasi-experimental evidence suggests that health insurance is associated with mortality reductions for a severely ill subset of the population but does not have a discernible effect in the general population (Card et al., 2008, 2009), and that it has positive – but small and imprecisely estimated – effects on self-reported health (Card et al., 2004).

Compared to the voluminous observational literature and the sizable quasi-experimental literature on the impact of health insurance on health care utilization and health outcomes, there is a remarkable dearth of analysis of the impact of health insurance on risk smoothing, arguably its primary purpose. The RAND health insurance experiment did not analyze the impact of health insurance on exposure to out-of-pocket medical expenditure risk. The only existing experimental evidence we know of is a 2005 experiment in Mexico that randomized the provision of health insurance and of improvements in health facilities in selected communities; 10 months later, the study found that households in the insured communities had lower average out-of-pocket expenditures and were less likely to have out-of-pocket costs of more than 30 percent of their post-subsistence income (King et al., 2009). In the U.S., we know of only three quasi-experimental studies of the impact of health insurance on risk exposure. Finkelstein and McKnight (2008) and Englehardt and Gruber (2010) examine the impact of the introduction of Medicare (Parts A and B) and of Medicare Part D, respectively, on the distribution of out-of-pocket medical expenditures. Like us,
both studies find that insurance coverage is associated with a pronounced decline in the right tail of the out-of-pocket expenditure distribution. Unlike us, Gross and Notowidigdo (2011) estimate that Medicaid expansions are associated with a decline in personal bankruptcies, although their expansions cover individuals at slightly higher income (around 100 to 200 percent of FPL).

6.3 Extrapolation to other contexts

A natural instinct is to try to generalize our experimental estimates to other contexts, including the planned 2014 Medicaid expansions. Any such attempt comes with important caveats. First, by their nature, our findings speak to the partial equilibrium effects of covering a small number of people, holding constant the rest of the health care system. In particular, the lottery we studied covered about 10,000 low-income uninsured adults, relative to a total Oregon population of about 3.8 million, including about 650,000 uninsured and about 200,000 low-income adult uninsured.53 Our estimates are therefore difficult to extrapolate to the likely effects of much larger health insurance expansions, in which there may well be supply side responses from the health care sector (Finkelstein, 2007).

Second, our results are specific to a population of low-income, uninsured adults in Oregon who expressed interest in obtaining health insurance (by signing up for the lottery). This group is not representative of the low-income uninsured adults in the rest of the United States on a number of observable (and presumably unobservable) dimensions. One striking difference is that our study population has more whites and fewer African-Americans (by about 15 percentage points each) than the general low-income, uninsured adult, US population. It is also somewhat (4 to 5 years) older and on some measures appears to be in somewhat worse self-reported health (Allen et al. 2010).54 These differences are amplified when focusing on compliers, who, relative to the overall lottery population, are somewhat older, more white, in worse health, and of lower socio-economic status (as proxied by education and having

53 Estimates are from various public sources from 2008 and 2009 and can be found here: www.statehealthfacts.org (last accessed February 2011). “Low-income adults” refers to adults aged 19-64 below 100 percent of the federal poverty level.
54 Allen et al (2010) also note that the overall health care environment in Oregon is similar in many ways to the nation as a whole, including the market share of public hospitals, the magnitude of uncompensated care as a fraction of hospital charges, and physicians per capita.
revolving credit at the time of the lottery); although we examined heterogeneity in treatment effect by these and other observables, we lacked power to draw precise inferences (see Appendix 3.4 and Table A23 for details).

Although our setting shares some features with the planned 2014 Medicaid expansions, it might not with other insurance expansions. The insurance offered in this setting was free or heavily subsidized, so our estimates capture the combined effect of insurance at actuarially fair prices and the wealth effect from the large premium subsidy; average annual OHP Standard expenditures – and hence an actuarially fair premium – are about $3,000, which is quite high relative to the actual annual premium of $0 to $240. Presumably, however, most health insurance coverage for this type of low income population would also be heavily or completely subsidized. Our results suggest that Medicaid provides benefits to this population above and beyond the non-Medicaid alternatives that exist through various safety net options.
**AUTHOR DISCLOSURES**

*Finkelstein* serves on the CBO’s Panel of Health Advisers.

*Taubman* has no disclosures.

*Wright* is employed by Providence Health & Services, a non-profit integrated health care delivery system.

*Bernstein* has no disclosures.

*Gruber* was a paid technical consultant to the Obama Administration during the development of the Affordable Care Act and a paid consultant to the state of Oregon for modeling health insurance expansion options, and serves on the CBO’s Panel of Health Advisers.

*Newhouse* is a director of and holds equity in Aetna, which sells Medicaid policies, and serves on the CBO’s Panel of Health Advisers.

*Allen* is employed by Providence Health & Services, a non-profit integrated health care delivery system. She formerly served as director of the Medicaid Advisory Committee and as staff to the Oregon Health Fund Board at the Office for Oregon Health Policy and Research.

*Baicker* is a MedPAC Commissioner, serves on the CBO’s Panel of Health Advisers, has received honoraria from several physician groups for speaking engagements, and previously served on the Bush Administration’s Council of Economic Advisers.
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Kroenke K, Spitzer RL, Williams JB. 2003. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care; 41:1284-92


Figure 1a and 1b: Distribution of out-of-pocket medical expenses, last six months (survey data)

Notes: Figure 1a shows the distribution of out-of-pocket medical spending for controls, and the estimated distribution for treatments through the 95th quantile; the estimated distribution for treatments is the control distribution added to the beta on LOTTERY from the quantile estimation of the reduced form equation (1). Figure 1b plots the quantile estimates from equation (1) (along with their 95 percent confidence interval) starting from the smallest quantile that is non-zero in either the treatment or control distribution through the 95th quantile. The confidence intervals are calculated based on 500 bootstraps clustered on household. Data are from the sample of survey responders (N=24,012); all results use survey weights. Quantile estimation of equation (1) includes household size dummies, survey wave dummies, and the interaction of the two.
Figure 2a and 2b: Distribution of amount owed in medical debt (survey data)

Notes: Figure 2a shows the distribution of medical debt for controls, and the estimated distribution for treatments through the 95th quantile; the estimated distribution for treatments is the control distribution added to the beta on LOTTERY from the quantile estimation of the reduced form equation (1). Figure 2b plots the quantile estimates from equation (1) (along with their 95 percent confidence interval) starting from the smallest quantile that is non-zero in either the treatment or control distribution through the 95th quantile. The confidence intervals are calculated based on 500 bootstraps clustered on household. Data are from the sample of survey responders (N=24,012); all results use survey weights. Quantile estimation of equation (1) includes household size dummies, survey wave dummies, and the interaction of the two.
Figure 3a and 3b: Distribution of medical collection amount owed (credit report data)

Notes: Figure 3a shows the distribution of amount owed in medical collections for controls, and the estimated distribution for treatments through the 95th quantile; the estimated distribution for treatments is the control distribution added to the beta on LOTTERY from the quantile estimation of the reduced form equation (1). Figure 3b plots the quantile estimates from equation (1) (along with their 95 percent confidence interval) starting from the smallest quantile that is non-zero in either the treatment or control distribution through the 95th quantile. The confidence intervals are calculated based on 500 bootstraps clustered on household. Data are from the sample of survey responders (N=49,545). Quantile estimation of equation (1) includes household size dummies, lottery draw dummies, and the individual’s pre-lottery medical collection amount owed.
### Table 1: Demographic Characteristics of Study Population (Control Group)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control mean</th>
<th>Variable</th>
<th>Control mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Panel A: Full sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td><strong>Language</strong></td>
<td></td>
</tr>
<tr>
<td>% Female</td>
<td>0.557</td>
<td>% English preferred</td>
<td>0.922</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td><strong>Zip code level variables</strong></td>
<td></td>
</tr>
<tr>
<td>% 50-64</td>
<td>0.267</td>
<td>% MSA</td>
<td>0.773</td>
</tr>
<tr>
<td>% 20-50</td>
<td>0.733</td>
<td>Zip code median household incom</td>
<td>$39,265</td>
</tr>
<tr>
<td></td>
<td>Panel B: Survey responders only</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td><strong>Health Status</strong></td>
<td></td>
</tr>
<tr>
<td>% White</td>
<td>0.820</td>
<td>Ever diagnosed with:</td>
<td></td>
</tr>
<tr>
<td>% Black</td>
<td>0.038</td>
<td>Diabetes</td>
<td>0.175</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asthma</td>
<td>0.276</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Blood Pressure</td>
<td>0.399</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td>Emphysema or Chronic Bronchiti</td>
<td>0.129</td>
</tr>
<tr>
<td>% Spanish/Hispanic/Latino</td>
<td>0.123</td>
<td>Depression (screen positive)</td>
<td>0.557</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td><strong>Income (% federal poverty line)</strong></td>
<td></td>
</tr>
<tr>
<td>% Less than High School</td>
<td>0.177</td>
<td>&lt;50%</td>
<td>0.406</td>
</tr>
<tr>
<td>% High school diploma or GED</td>
<td>0.491</td>
<td>50-75%</td>
<td>0.138</td>
</tr>
<tr>
<td>% Vocational Training or 2-yr degree</td>
<td>0.220</td>
<td>75-100%</td>
<td>0.140</td>
</tr>
<tr>
<td>% 4 year college degree or more</td>
<td>0.112</td>
<td>100-150%</td>
<td>0.177</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Above 150%</td>
<td>0.139</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% don't currently work</td>
<td>0.551</td>
<td><strong>Insurance Coverage</strong></td>
<td></td>
</tr>
<tr>
<td>% work &lt;20 hrs per week</td>
<td>0.090</td>
<td>Any Insurance?</td>
<td>0.325</td>
</tr>
<tr>
<td>% work 20-29 hrs per week</td>
<td>0.099</td>
<td>OHP / Medicaid</td>
<td>0.117</td>
</tr>
<tr>
<td>% work 30+ hrs per week</td>
<td>0.259</td>
<td>Private Insurance</td>
<td>0.128</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>0.102</td>
</tr>
<tr>
<td><strong>Average household income (2008)</strong> $</td>
<td>13,053</td>
<td># of months of last 6 with insuranc</td>
<td>1.738</td>
</tr>
</tbody>
</table>

Notes: All statistics are reported for control individuals only. Panel A reports the control means for pre-randomization demographics taken from the lottery list (from January and February 2008) for the whole sample (N=45088 for controls). Age refers to age at the end of the study period. “English as preferred language” indicates whether the individual did not check a box requesting materials in a language other than English. Panel B reports control means of survey questions for survey responders (N = 11933 for controls), weighted using survey weights. “Household income” is gross household income (in $) for 2008 (before taxes and deductions but including any cash assistance or unemployment assistance received); it is reported in bins and we assign individuals the income at the mid-point of their bin (see Appendix Figure A4 for details). For the insurance questions, we code as “yes” if the respondent checked that insurance type box; since the survey allows one to check multiple boxes for types of insurance, the subgroups (OHP/Medicaid, private, and other) won’t necessarily add up to “any”. Private insurance includes employer and privately paid insurance; “Other” insurance includes “Medicare and other.” We treat responses for insurance as missing if the responder checked “I don’t know” or left all check boxes blank. We construct income relative to the federal poverty line based on self-reported income and self reported (total) number of household members. See Appendix 3 for more details.
### Table 2: Treatment - Control Balance

<table>
<thead>
<tr>
<th></th>
<th>Control Mean (std dev) for full sample</th>
<th>Difference between treatment and control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Full sample</td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td>(2)</td>
</tr>
</tbody>
</table>

**Panel A: Match / response rates**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched in September 09 credit data</td>
<td>0.663</td>
<td>-0.004</td>
<td>(0.473)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Responded to survey</td>
<td>0.506</td>
<td>-0.016</td>
<td>(0.500)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Response time (in days)</td>
<td>53.0</td>
<td>1.638</td>
<td>(57.8)</td>
<td>(1.088)</td>
</tr>
</tbody>
</table>

**Panel B: Pre-randomization characteristics**

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[p-value]</td>
</tr>
<tr>
<td>Lottery list variables</td>
<td>1.286</td>
<td>0.553</td>
</tr>
<tr>
<td></td>
<td>[0.239]</td>
<td>[0.836]</td>
</tr>
<tr>
<td>Pre-randomization outcomes</td>
<td>0.543</td>
<td>0.921</td>
</tr>
<tr>
<td></td>
<td>[0.844]</td>
<td>[0.518]</td>
</tr>
<tr>
<td>Both of the above</td>
<td>0.915</td>
<td>0.793</td>
</tr>
<tr>
<td></td>
<td>[0.56]</td>
<td>[0.726]</td>
</tr>
<tr>
<td>N</td>
<td>74922</td>
<td>49980</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]

**Notes:** In Panel A, we analyze match and response rates. The first column reports the mean and standard deviation for the control sample of the outcome shown in the left hand column. Columns 3 and 4 report estimated differences between treatments and controls for the dependent variable shown in the left hand column and the sample indicated in the column heading. Specifically they report the coefficient on LOTTERY based on estimating equation (1). All regressions include household fixed effects and cluster on household. In addition, in column (4) we include survey wave fixed effects and the interaction of survey wave fixed effects and household fixed effects and use survey weights. The full sample (i.e. the sample used in the hospital discharge and mortality data) is used in column 3 and the entire survey sample is used in column 4. In Panel B we report the F-statistic and p-value from regressing multiple pre-randomization characteristics on LOTTERY in equation (1). “Lottery list variables” are common across all three samples and consist of nine demographic variables derived from information provided at the time of lottery sign up: year of birth; sex; whether English is their preferred language for receiving materials; whether the individual signed themselves up for the lottery or were signed up by a household member; whether the individual gave their address as a PO box; whether they signed up the first day the lottery list was open; the median household income in the 2000 census from their zip code; whether the zip code they gave is within a census-defined MSA; and whether they provided a phone number on sign up. “Pre randomization outcomes” are specific to the sample (we look at the hospital outcomes that we subsequently analyze for column 2, the credit report outcomes we subsequently analyze for column 3, and a few measures from each that approximate survey questions we subsequently analyze for column 4). More detail on the pre-randomization outcomes, the exact regression specifications, and the results for each variable analyzed in Panel B are presented in Appendix 3, Table A13.
## Table 3: First Stage Estimates

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th>Credit report subsample</th>
<th>Survey respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control mean</td>
<td>Estimated FS</td>
<td>Control mean</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>(1) Ever on Medicaid</td>
<td>0.141</td>
<td>0.256</td>
<td>0.135</td>
</tr>
<tr>
<td></td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>(2) Ever on OHP Standard</td>
<td>0.027</td>
<td>0.264</td>
<td>0.028</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>(3) # of Months on Medicaid</td>
<td>1.408</td>
<td>3.355</td>
<td>1.352</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
<td>(0.055)</td>
<td>(0.055)</td>
</tr>
<tr>
<td>(4) On Medicaid, end of study period</td>
<td>0.106</td>
<td>0.148</td>
<td>0.101</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>(5) Currently have any insurance (self report)</td>
<td></td>
<td></td>
<td>0.325</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.008)</td>
</tr>
<tr>
<td>(6) Currently have private insurance (self report)</td>
<td></td>
<td></td>
<td>0.128</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.005)</td>
</tr>
<tr>
<td>(7) Currently on Medicaid (self report)</td>
<td></td>
<td></td>
<td>0.117</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.006)</td>
</tr>
<tr>
<td>(8) Currently on Medicaid</td>
<td></td>
<td></td>
<td>0.093</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.006)</td>
</tr>
<tr>
<td>(9) Ever on Food Stamps</td>
<td>0.606</td>
<td>0.017</td>
<td>0.594</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>(10) Food Stamp Benefits ($)</td>
<td>1694</td>
<td>58.5</td>
<td>1716</td>
</tr>
<tr>
<td></td>
<td>(14.8)</td>
<td>(18.5)</td>
<td>(18.5)</td>
</tr>
<tr>
<td>N</td>
<td>74,922</td>
<td>49,980</td>
<td>23,741</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses.)

**Notes:** Even numbered columns report the coefficient and standard error on “LOTTERY” from estimating the first stage equation (4) with the dependent variable “INSURANCE” defined in the left hand column; odd numbered columns report the control mean for that measure of “INSURANCE”. “Full sample” is the sample analyzed in the hospital discharge and mortality data. All regressions include dummies for household size and adjust standard errors for household clusters. The regressions in columns 2 and 4 also include lottery draw dummies; the regressions in column 6 also include dummies for survey wave and survey wave interacted with household size dummies, and use survey weights. The insurance measures are taken from the Medicaid enrollment administrative data except for those labeled “self report” (row 5 through 7) which are taken from the survey. In the survey, respondents could report various types of insurance; we define “private insurance” as employer or private insurance and “any insurance” as Medicaid, Medicare, employer, private or other insurance. In row 8 insurance is measured as being on Medicaid according to the state Medicaid enrollment data on the day the survey was returned. In Row 10 Food Stamp Benefits measure total household benefits received over the study period.
### Table 4a: Hospital Utilization: Admission Probabilities (Administrative Data)

<table>
<thead>
<tr>
<th>Extensive Margin (Any)</th>
<th>Control Mean (1)</th>
<th>Reduced Form (2)</th>
<th>2SLS (3)</th>
<th>p-values (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: All hospital admissions</td>
<td>0.067 (0.250)</td>
<td>0.005 (0.002)</td>
<td>0.021 (0.007)</td>
<td>[0.004]</td>
</tr>
<tr>
<td>Panel B: Admissions through ER</td>
<td>0.048 (0.214)</td>
<td>0.002 (0.002)</td>
<td>0.007 (0.006)</td>
<td>[0.265]</td>
</tr>
<tr>
<td>Panel C: Admissions not through ER</td>
<td>0.029 (0.167)</td>
<td>0.004 (0.001)</td>
<td>0.016 (0.005)</td>
<td>[0.002]</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)

[Per comparison p-values in square brackets]

{Family wise p-values in curly brackets}

**Notes:** Table investigates non-childbirth-related hospitalizations during the time period from notification date to August 31, 2009. Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 3 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and (where applicable) the family wise p-value across the three different measures of utilization used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effect, lottery draw fixed effects and the analogous outcome measure for the time period from January 1, 2008 through the notification date. All standard errors are clustered on the household. Sample consists of entire sample universe (N = 74,922).
### Table 4b: Total Hospital Utilization (Administrative Data)

<table>
<thead>
<tr>
<th></th>
<th>Control Mean</th>
<th>Reduced Form</th>
<th>2SLS p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>Panel A: All hospital admissions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days</td>
<td>0.498</td>
<td>0.026</td>
<td>0.101</td>
</tr>
<tr>
<td></td>
<td>(3.795)</td>
<td>(0.027)</td>
<td>(0.104)</td>
</tr>
<tr>
<td>List Charges</td>
<td>2,613</td>
<td>258</td>
<td>1,009</td>
</tr>
<tr>
<td></td>
<td>(19942)</td>
<td>(146)</td>
<td>(569)</td>
</tr>
<tr>
<td>Procedures</td>
<td>0.155</td>
<td>0.018</td>
<td>0.070</td>
</tr>
<tr>
<td></td>
<td>(1.08)</td>
<td>(0.008)</td>
<td>(0.032)</td>
</tr>
<tr>
<td><em>Standardized Treatment effect</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.012</td>
<td>0.047</td>
<td>0.073</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.026)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel B: Admissions through ER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days</td>
<td>0.299</td>
<td>0.023</td>
<td>0.089</td>
</tr>
<tr>
<td></td>
<td>(2.326)</td>
<td>(0.017)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>List Charges</td>
<td>1,502</td>
<td>163</td>
<td>636</td>
</tr>
<tr>
<td></td>
<td>(12749)</td>
<td>(96)</td>
<td>(376)</td>
</tr>
<tr>
<td>Procedures</td>
<td>0.081</td>
<td>0.008</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>(0.694)</td>
<td>(0.005)</td>
<td>(0.021)</td>
</tr>
<tr>
<td><em>Standardized Treatment effect</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.011</td>
<td>0.044</td>
<td>0.100</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.027)</td>
<td></td>
</tr>
<tr>
<td><strong>Panel C: Admissions not through ER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days</td>
<td>0.199</td>
<td>0.003</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>(2.38)</td>
<td>(0.017)</td>
<td>(0.065)</td>
</tr>
<tr>
<td>List Charges</td>
<td>1,110</td>
<td>98</td>
<td>384</td>
</tr>
<tr>
<td></td>
<td>(12422)</td>
<td>(91)</td>
<td>(356)</td>
</tr>
<tr>
<td>Procedures</td>
<td>0.075</td>
<td>0.010</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>(0.708)</td>
<td>(0.006)</td>
<td>(0.022)</td>
</tr>
<tr>
<td><em>Standardized Treatment effect</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.008</td>
<td>0.030</td>
<td>0.254</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.026)</td>
<td></td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]
(Family wise p-values in curly brackets)

**Notes:** Table investigates non-childbirth-related hospitalizations during the time period from notification date to August 31, 2009. All outcomes are measured unconditionally (i.e. are not conditional on admission). Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 3 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and (where applicable) the family wise p-value across the three different measures of utilization used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effect, lottery draw fixed effects and the analogous outcome measure for the time period from January 1, 2008 through the notification date. All standard errors are clustered on the household. Sample consists of entire sample universe (N = 74922).
Table 5: Health Care Utilization (Survey Data)

<table>
<thead>
<tr>
<th></th>
<th>Extensive Margin (Any)</th>
<th>Total Utilization (Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Mean</td>
<td>Reduced Form</td>
</tr>
<tr>
<td>Rx drugs currently</td>
<td>0.637</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>(0.481)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Outpatient visits last six months</td>
<td>0.574</td>
<td>0.062</td>
</tr>
<tr>
<td></td>
<td>(0.494)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>ER visits last six months</td>
<td>0.261</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>(0.439)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Inpatient Hospital admissions last six months</td>
<td>0.072</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.259)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Standardized treatment effect</td>
<td>0.050</td>
<td>0.173 [&lt;0.0001]</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.036)</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]
{Family wise p-values in curly brackets}

Notes: Hospital admissions exclude childbirth. Columns 2 and 6 report the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Columns 3 and 7 report the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Columns 4 and 8 report the per-comparison p value and the family wise p-value across the four different measures of utilization used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, survey wave fixed effects, and the interaction between the two. All standard errors are clustered on the household and all regressions are weighted using survey weights. Sample consists of survey responders (N = 23741).

*To calculate the implied spending effects associated with the estimated utilization effects we use data from the 2002-2007 (pooled) Medical Expenditure Panel Survey (MEPS) on expenditures of all nonelderly (19-64) adults below 100 percent of poverty who are publicly insured. This gives us a total sample of over 7,500 individuals. We use their expenditures (all inflated with the CPI-U to 2007 dollars) to calculate average expenditures per outpatient visit, average expenditures per ER visit, average expenditures per inpatient visit (for visits not related to childbirth), and average semi-annual (six month) spending on prescription drug. All spending is total expenditures (i.e. not just insured) expenditures. The underlying costs are $150 per outpatient visit, $435 per ER visit, $7,523 per inpatient visit, and $156 six month expenditure per current prescription drug; we multiply these all by two to get annual costs.
Table 6: Compliance with Recommended Preventive Care (Survey Data)

<table>
<thead>
<tr>
<th></th>
<th>Control Mean (1)</th>
<th>Reduced Form 2SLS (3)</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood cholesterol checked (ever)</td>
<td>0.625</td>
<td>0.114</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td></td>
<td>(0.484)</td>
<td>(0.026)</td>
<td>{&lt;0.0001}</td>
</tr>
<tr>
<td>Blood tested for high blood sugar / diabetes (ever)</td>
<td>0.604</td>
<td>0.090</td>
<td>[0.0004]</td>
</tr>
<tr>
<td></td>
<td>(0.489)</td>
<td>(0.026)</td>
<td>{&lt;0.0001}</td>
</tr>
<tr>
<td>Mammogram within last 12 months (women &gt;=40)</td>
<td>0.298</td>
<td>0.187</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td></td>
<td>(0.457)</td>
<td>(0.04)</td>
<td>{&lt;0.0001}</td>
</tr>
<tr>
<td>Pap test within last 12 months (women)</td>
<td>0.406</td>
<td>0.183</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td></td>
<td>(0.491)</td>
<td>(0.034)</td>
<td>{&lt;0.0001}</td>
</tr>
<tr>
<td><strong>Standardized treatment effect</strong></td>
<td>0.087</td>
<td>0.300</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.041)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 2 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and the family wise p-value across the four different preventive care measures used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, survey wave fixed effects, and the interaction between the two. All standard errors are clustered on the household and all regressions are weighted using survey weights. Sample consists of survey responders (N = 23741).
Table 7: Financial Strain (Administrative Data)

<table>
<thead>
<tr>
<th>Panel A: Overall</th>
<th>Control Mean</th>
<th>Reduced Form</th>
<th>2SLS</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Any bankruptcy</td>
<td>0.014</td>
<td>0.002</td>
<td>0.009</td>
<td>[0.106]</td>
</tr>
<tr>
<td></td>
<td>(0.119)</td>
<td>(0.001)</td>
<td>(0.005)</td>
<td>[0.358]</td>
</tr>
<tr>
<td>Any lien</td>
<td>0.021</td>
<td>0.001</td>
<td>0.005</td>
<td>[0.406]</td>
</tr>
<tr>
<td></td>
<td>(0.144)</td>
<td>(0.001)</td>
<td>(0.006)</td>
<td>[0.698]</td>
</tr>
<tr>
<td>Any judgment</td>
<td>0.064</td>
<td>0.001</td>
<td>0.005</td>
<td>[0.573]</td>
</tr>
<tr>
<td></td>
<td>(0.244)</td>
<td>(0.002)</td>
<td>(0.010)</td>
<td>[0.698]</td>
</tr>
<tr>
<td>Any collection</td>
<td>0.500</td>
<td>-0.012</td>
<td>-0.048</td>
<td>[0.003]</td>
</tr>
<tr>
<td></td>
<td>(0.500)</td>
<td>(0.004)</td>
<td>(0.016)</td>
<td>[0.013]</td>
</tr>
<tr>
<td>Any delinquency (credit accounts)</td>
<td>0.366</td>
<td>0.002</td>
<td>0.006</td>
<td>[0.704]</td>
</tr>
<tr>
<td></td>
<td>(0.482)</td>
<td>(0.004)</td>
<td>(0.017)</td>
<td>[0.698]</td>
</tr>
<tr>
<td>Standardized treatment effect</td>
<td>0.002</td>
<td>0.009</td>
<td>[0.653]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.019)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Medical Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any medical collection</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Amount owed in medical collections</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Standardized treatment effect</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: Non-Medical Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any nonmedical collection</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Amount owed in non-medical collections</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Standardized treatment effect</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]

{Family wise p-values in curly brackets}

Notes: All outcomes are measured since notification date through September 2009. Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 2 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and the family wise p-value across the different measures used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, lottery draw fixed effects, and the analogous outcome measure from the February 2008 credit report data. All standard errors are clustered on the household. Sample consists of all those matched to credit report data (N =49980).
### Table 8: Financial Strain (Survey Data)

<table>
<thead>
<tr>
<th></th>
<th>Control Mean (1)</th>
<th>Reduced Form (2)</th>
<th>2SLS (3)</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any out of pocket medical expenses, last six months</td>
<td>0.555 (0.497)</td>
<td>-0.058 (0.008)</td>
<td>-0.200 (0.026)</td>
<td>[&lt;0.0001] {&lt;0.0001}</td>
</tr>
<tr>
<td>Owe money for medical expenses currently</td>
<td>0.597 (0.491)</td>
<td>-0.052 (0.008)</td>
<td>-0.180 (0.026)</td>
<td>[&lt;0.0001] {&lt;0.0001}</td>
</tr>
<tr>
<td>Borrowed money or skipped other bills to pay medical bills, last six</td>
<td>0.364 (0.481)</td>
<td>-0.045 (0.007)</td>
<td>-0.154 (0.025)</td>
<td>[&lt;0.0001] {&lt;0.0001}</td>
</tr>
<tr>
<td>Refused treatment bc of medical debt, last six months</td>
<td>0.081 (0.273)</td>
<td>-0.011 (0.004)</td>
<td>-0.036 (0.014)</td>
<td>[0.01] {0.01}</td>
</tr>
<tr>
<td>Standardized treatment effect</td>
<td>-0.089 (0.010)</td>
<td>-0.305 (0.035)</td>
<td></td>
<td>[&lt;0.0001]</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]
{Family wise p-values in curly brackets}

Notes: Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 3 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and the family wise p-value across the four different measures of financial strain used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, survey wave fixed effects, and the interaction between the two. All standard errors are clustered on the household and all regressions are weighted using survey weights. Sample consists of survey responders (N =23741).
Table 9: Health

<table>
<thead>
<tr>
<th></th>
<th>Control Mean (1)</th>
<th>Reduced Form (2)</th>
<th>2SLS (3)</th>
<th>p-values (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A: Administrative data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td>0.992 (0.092)</td>
<td>0.00032 (0.001)</td>
<td>0.001 (0.003)</td>
<td>[0.638]</td>
</tr>
<tr>
<td><strong>Panel B: Survey Data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self reported health good / very good / excellent (not fair or poor)</td>
<td>0.548 (0.498)</td>
<td>0.039 (0.008)</td>
<td>0.133 (0.026)</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Self reported health not poor (fair, good, very good, or excellent)</td>
<td>0.86 (0.347)</td>
<td>0.029 (0.005)</td>
<td>0.099 (0.018)</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Health about the same or gotten better over last six months</td>
<td>0.714 (0.452)</td>
<td>0.033 (0.007)</td>
<td>0.113 (0.023)</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td># of days physical health good, past 30 days*</td>
<td>21.862 (10.384)</td>
<td>0.381 (0.162)</td>
<td>1.317 (0.563)</td>
<td>[0.019]</td>
</tr>
<tr>
<td># days poor physical or mental health did not impair usual activity, past 30 days*</td>
<td>20.329 (10.939)</td>
<td>0.459 (0.175)</td>
<td>1.585 (0.606)</td>
<td>[0.009]</td>
</tr>
<tr>
<td># of days mental health good, past 30 days*</td>
<td>18.738 (11.445)</td>
<td>0.603 (0.184)</td>
<td>2.082 (0.64)</td>
<td>[0.001]</td>
</tr>
<tr>
<td>Did not screen positive for depression, last two weeks</td>
<td>0.671 (0.470)</td>
<td>0.0230 (0.007)</td>
<td>0.078 (0.025)</td>
<td>[0.001]</td>
</tr>
<tr>
<td><strong>Standardized treatment effect</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0590 (0.011)</td>
<td>0.203 (0.039)</td>
<td></td>
<td>[&lt;0.0001]</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]
{Family wise p-values in curly brackets}

**Notes:** Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 3 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and the family wise p-value across the different measures used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects and standard errors are clustered on the household. The regressions in panel A include lottery draw fixed effects, and the dependent variable “alive” is measured from the notification date through September 2009 (N=74922). The regressions in panel B include survey wave fixed effects, and the interaction of survey wave fixed effects with household size fixed effects, and are weighted using the survey weights (N = 23741).

*These questions were worded to ask about # of days health "not good" or "impaired"; we switched the sign for consistency with the other measures. See Appendix Figure A4 for the exact survey wording.
### Table 10: Potential Mechanisms for Improved Health (Survey Data)

<table>
<thead>
<tr>
<th>Panel A: Access to care</th>
<th>Control Mean (1)</th>
<th>Reduced Form (2)</th>
<th>2SLS (3)</th>
<th>p-values (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have usual place of clinic-based care</td>
<td>0.499 (0.500)</td>
<td>0.099 (0.008)</td>
<td>0.339 (0.027)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Have personal doctor</td>
<td>0.490 (0.500)</td>
<td>0.081 (0.008)</td>
<td>0.280 (0.026)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Got all needed medical care, last six months</td>
<td>0.684 (0.465)</td>
<td>0.069 (0.006)</td>
<td>0.239 (0.022)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Got all needed drugs, last six months</td>
<td>0.765 (0.424)</td>
<td>0.056 (0.006)</td>
<td>0.195 (0.019)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Didn't use ER for non-emergency, last six months</td>
<td>0.916 (0.278)</td>
<td>-0.001 (0.004)</td>
<td>-0.004 (0.015)</td>
<td>0.804</td>
</tr>
<tr>
<td><strong>Standardized treatment effect</strong></td>
<td></td>
<td>0.128 (0.008)</td>
<td>0.440 (0.029)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

| Panel B: Quality of care | | | | |
|--------------------------|------------------|---------|-------------|
| Quality of care received last six months good/vg/exc (condl on any) | 0.708 (0.455) | 0.043 (0.008) | 0.142 (0.027) | <0.0001 |

| Panel C: Happiness | | | |
|---------------------|------------------|---------|
| Very happy or pretty happy (vs. not too happy) | 0.594 (0.491) | 0.056 (0.007) | 0.191 (0.026) | <0.0001 |

(Standard errors in parentheses)
[Per comparison p-values in square brackets]
[Family wise p-values in curly brackets]

**Notes:** Column 2 reports the coefficient and standard error on LOTTERY from estimating equation (1) by OLS. Column 3 reports the coefficient and standard error on INSURANCE from estimating equation (3) by IV. Column 4 reports the per-comparison p value and the family wise p-value across the four different measures of financial strain used to create the standardized treatment effect. Standardized treatment effect reports results based on equation (2). All regressions include household size fixed effects, survey wave fixed effects, and the interaction between the two. All standard errors are clustered on the household and all regressions are weighted using survey weights. Sample consists of survey responders (N = 23741).
<table>
<thead>
<tr>
<th></th>
<th>Reduced Form Estimates From Survey:</th>
<th>P-value of Difference Between:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial (0m)</td>
<td>6m</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Utilization (extensive margin)</td>
<td>0.004</td>
<td>0.047</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.020)</td>
</tr>
<tr>
<td></td>
<td>[0.656]</td>
<td>[0.02]</td>
</tr>
<tr>
<td>Utilization (total)</td>
<td>0.000</td>
<td>0.027</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.020)</td>
</tr>
<tr>
<td></td>
<td>[0.978]</td>
<td>[0.187]</td>
</tr>
<tr>
<td>Financial strain</td>
<td>-0.025</td>
<td>-0.099</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.020)</td>
</tr>
<tr>
<td></td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Health</td>
<td>0.042</td>
<td>0.097</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.023)</td>
</tr>
<tr>
<td></td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Access</td>
<td>0.047</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.019)</td>
</tr>
<tr>
<td></td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
</tbody>
</table>

^ This analysis was not pre-specified

(Standard errors in parentheses)
[Per comparison p-values in square brackets]

**Notes:** Table reports standardized treatment effects from estimating equation (1) in three different surveys. The first column shows the results for our so-called “initial survey” which occurred about 2.6 months after lottery notification; the second column shows results for our “six month survey” which occurred about 8 months after lottery notification (six months after insurance coverage began); the third column shows results for our “main survey” which occurred about 15 months after lottery notification; this is the survey that has been analyzed in prior tables. The surveys had similar response rates and questionnaires; the “six month” survey was conducted on an approximately 20 percent sample of the other surveys (see Section 3.4 and Appendix 1 for details). Columns 1, 2, and 3 report the coefficient, standard error and p-value on LOTTERY from estimating equation (1) by OLS. Columns 3, 4, and 5 report the p-value of the difference between various estimates. All regressions include household size fixed effects, survey wave fixed effects, and the interaction of survey wave and household size fixed effects. Regressions based on the “six month” and “main” surveys (columns 2 and 3) are weighted using the survey weights for those surveys. Standard errors are clustered on the household. N = 26,423 for the initial survey, N=6,359 for the six month survey, and N=23,741 for the main survey. The individual components of the standardized treatment effects are the same as in the earlier tables except that “health” excludes the depression screen question and “access” excludes the personal doctor question (as these questions were not asked in the initial survey). The reference period for the underlying questions is usually either “currently” or “in the last six months” (see prior tables for details).
Table 12: Observational Estimates of Effect of Insurance in Study Population

<table>
<thead>
<tr>
<th></th>
<th>Random assignment</th>
<th>Any Medicaid vs. No Medicaid</th>
<th>Any medicaid vs. No Medicaid (controls only)</th>
<th>OHP Standard vs. No Medicaid (treatment only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size</td>
<td>74,922</td>
<td>74,922</td>
<td>45,088</td>
<td>26,437</td>
</tr>
<tr>
<td>Percent insured</td>
<td>26</td>
<td>26</td>
<td>17</td>
<td>32</td>
</tr>
</tbody>
</table>

**Panel A: Administrative Data**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total hospital utilization</td>
<td>0.047</td>
<td>0.241</td>
<td>0.352</td>
<td>0.133</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.015)</td>
<td>(0.030)</td>
<td>(0.017)</td>
</tr>
<tr>
<td></td>
<td>[0.073]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Financial strain</td>
<td>0.009</td>
<td>0.008</td>
<td>0.024</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.005)</td>
<td>(0.008)</td>
<td>(0.008)</td>
</tr>
<tr>
<td></td>
<td>[0.653]</td>
<td>[0.118]</td>
<td>[0.002]</td>
<td>[0.534]</td>
</tr>
</tbody>
</table>

**Panel B: Survey Data**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total health care utilization</td>
<td>0.137</td>
<td>0.291</td>
<td>0.460</td>
<td>0.193</td>
</tr>
<tr>
<td></td>
<td>(0.038)</td>
<td>(0.014)</td>
<td>(0.030)</td>
<td>(0.018)</td>
</tr>
<tr>
<td></td>
<td>[0.0003]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Financial strain</td>
<td>-0.305</td>
<td>-0.165</td>
<td>-0.091</td>
<td>-0.199</td>
</tr>
<tr>
<td></td>
<td>(0.035)</td>
<td>(0.011)</td>
<td>(0.020)</td>
<td>(0.015)</td>
</tr>
<tr>
<td></td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
<tr>
<td>Self reported health</td>
<td>0.203</td>
<td>-0.074</td>
<td>-0.127</td>
<td>-0.086</td>
</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(0.013)</td>
<td>(0.024)</td>
<td>(0.017)</td>
</tr>
<tr>
<td></td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
<td>[&lt;0.0001]</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)

Notes: All estimates are standardized treatment effects (see equation 2). Column 1 reports standardized treatment effects calculated based on IV estimation of equation (3). All other columns are based on OLS estimation of equation (1), but with the variable LOTTERY substituted with an “Any Medicaid” indicator in columns 2 and 3, and for an “OHP Standard vs no Medicaid” indicator in Column 4. Column 2 compares all those with any Medicaid coverage during our study period to those without Medicaid (regardless of lottery status); this represents the “as treated” analysis sometimes done in clinical trials. To avoid having much of the variation in insurance coming from the lottery, the third column perform the same analysis within the control group; here, most of the insurance coverage is OHP Plus which covers a somewhat different population than OHP Standard. The fourth column therefore performs the analysis within the treatment group, comparing those on OHP Standard to those with no Medicaid (and dropping the small percentage of treatment individuals on Plus). Regressions using the administrative data (panel A), include household size fixed effects, lottery draw fixed effects, and a pre-period measure of the dependent variable. Regressions using the survey data (panel B) include household size fixed effects survey wave fixed effects, and the interaction of the two, and are weighted using the survey weights. All standard errors are clustered on the household. For each standardized treatment effect we report the estimate, standard error, and per comparison p-value. The components of the standardized treatment effects are identical to those given in the relevant tables. Specifically, in Panel A hospital utilization is from Table 4b (all admissions), and financial strain is from Table 8, Panel A. In Panel B, total health care utilization is based on Table 6 (total utilization), financial strain is from Table 9, and self reported health is from Table 10, Panel B. The top two rows report the sample size and percent insured for the full sample universe.
Table 13: Observational Estimates of Effect of Insurance in BRFSS and NHIS

<table>
<thead>
<tr>
<th></th>
<th>IV Estimates (Study Population)</th>
<th>OLS Estimates Any Insurance vs.</th>
<th>OLS Estimates Any Insurance vs. No Insurance (covariate-adjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel A: Health Care Use (NHIS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of outpatient visit last six months</td>
<td>1.850 (0.235) [&lt;=0.0001]</td>
<td>1.593 (0.044) [&lt;=0.0001]</td>
<td>1.453 (0.06) [&lt;=0.0001]</td>
</tr>
<tr>
<td>Number of ER visits last six months</td>
<td>0.068 (0.117) [&lt;=0.0001]</td>
<td>0.124 (0.013) [&lt;=0.0001]</td>
<td>0.089 (0.018) [&lt;=0.0001]</td>
</tr>
<tr>
<td>Number of inpatient hospital admissions last six months</td>
<td>0.043 (0.042) [0.311]</td>
<td>0.125 (0.042) [0.003]</td>
<td>0.051 (0.073) [0.482]</td>
</tr>
<tr>
<td>Panel B: Health (BRFSS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self reported health good/ very good / excellent</td>
<td>0.133 (0.026) [&lt;=0.0001]</td>
<td>-0.020 (0.006) [0.001]</td>
<td>0.004 (0.006) [0.45]</td>
</tr>
<tr>
<td># days poor physical or mental health did not</td>
<td>1.317 (0.563) [0.019]</td>
<td>-2.406 (0.219) [&lt;=0.0001]</td>
<td>-0.931 (0.208) [&lt;=0.0001]</td>
</tr>
<tr>
<td>impair usual activity, past 30 days*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of days physical health good, past 30 days*</td>
<td>1.585 (0.606) [0.009]</td>
<td>-2.265 (0.189) [&lt;=0.0001]</td>
<td>-0.936 (0.175) [&lt;=0.0001]</td>
</tr>
<tr>
<td># of days mental health good, past 30 days*</td>
<td>2.082 (0.64) [0.001]</td>
<td>-0.606 (0.19) [0.184]</td>
<td>0.252 (0.172) [0.031]</td>
</tr>
<tr>
<td>Did not screen positive for depression, last two weeks</td>
<td>0.078 (0.025) [0.001]</td>
<td>-0.046 (0.031) [0.14]</td>
<td>-0.002 (0.031) [0.95]</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)
[Per comparison p-values in square brackets]

Notes: Table explores comparability of the randomized results to observational estimates. Column (1) reports the IV estimates for our study population reported in previous tables for specific outcomes that we observe in national, observational data. Columns 2 and 3 report the observational estimates using 2004-2009 national data on adults aged 19-64 below 100 percent of the federal poverty line from the NHIS (N=15,528) and the BRFSS (N=144,829) as indicated. The fraction of adults reporting insurance coverage is 65 percent in the NHIS and 56 percent in the BRFSS. In column 2 we report results from a bivariate OLS regression of the outcome on an insurance dummy. In column 3 we add demographic controls for age, race, gender, education, marital status, number of children in the household, employment status, and bins of annual income. In both columns 2 and 3 we report robust standard errors. The outcomes analyzed are based on virtually identical questions in our survey (column 1) and the national data (columns 2 and 3) except that the utilization questions in the NHIS are asked with a 12 month rather than a 6 month look-back period; we therefore divided the responses by two to try to make them comparable with our survey outcomes. In addition, the hospital utilization question in the NHIS does not explicitly exclude child birth while ours does.

* These questions were worded to ask about days "not good" or "impaired"; we switched the sign for consistency with the other measures. See Appendix Figure A4 for the exact survey wording.
A functional natural dentition for all – and for life? The oral healthcare system needs revision

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SUMMARY The cost of dental care adds to the costs of the already overburdened health sector. Do we – as patients and as society – receive oral health care that is both aligned with the actual disease experience and also, critically based on up-to-date scientific knowledge about the major oral diseases? In many places, the practice of dentistry reflects a response to disease patterns that once existed and is based on diagnostic and therapeutic approaches that are no longer valid. Instead, a new cadre of dental professionals is needed, one that is capable of meeting the actual health needs of our populations. This cadre should ensure that patients maintain a functioning dentition from cradle to grave based on cost-effective disease control principles. There is an urgent need to: (i) reconsider the roles of the different oral health cadres involved in the provision of oral health care; (ii) integrate oral health into general healthcare services; and (iii) restructure the training of oral health personnel. We advocate a radical reform of the oral healthcare system involving the training of two new types of professionals integrated with the general healthcare system: The oral healthcare provider – a highly skilled professional specialised in the diagnosis and control of oral diseases and with a profound understanding of oral health as part of general health – and the oral clinical specialist – whose role is the provision of advanced oral rehabilitation, able also to treat people with complex chronic diseases and multiple medications.

KEYWORDS: dental caries, periodontitis, oral health, dental care, oral rehabilitation, dental health services, dental education

Accepted for publication 15 June 2013

Introduction

In the early 1980s, the World Dental Federation (FDI) and the World Health Organization (WHO) established global oral health goals to be achieved by year 2000 (1). While covering the most relevant oral health parameters for children, adults and the elderly, the global nature of these goals may have presented challenges for their successful achievement. Certainly, the scope of the new goals for the year 2020 set in 2003 was reduced to ‘reflect the overall aspiration of the dental profession for global oral health’ (2) realising that the year 2000 goals had already been achieved or exceeded in many populations (2) and that local rather than global targets were called for. Ten objectives were formulated (Table 1) which most people would probably find it very hard to disagree with, but little advice was given how to go about fulfilling these objectives. A sense of threat to the dental profession appeared to have crept in, leading to the recent formulation by the FDI of the vision 2020 documents (3, 4) reflecting the dental professions’ desire for ‘an overarching long-term vision of the main challenges oral health is facing and direction as to how the profession can grow’. 
Dental caries remains the principal oral disease burden in populations worldwide (5). We find it unfortunate that the greatly improved understanding of the epidemiology, aetiology and pathogenesis of dental caries (6, 7) has not manifested itself in a change in the organisation of dentistry nor in the formation of dental professionals with the capacities needed to maintain and improve population’s oral health. New dental schools are readily established in many parts of the world, but these continue to produce traditional dentists competent in high-tech rehabilitation procedures; and these dentists continue to operate primarily in a ‘solo cottage practice model’ (8). Even in parts of Europe where during the 1980s there were closures or merging of existing dental schools, we now see new dental schools being established and even the reopening of previously closed ones. The number of dentists produced has tended to increase in most European countries (9), but the dental curricula remain largely unaffected by the dramatic changes in the oral disease patterns found in the population. An exception is the attempt in the UK to let the epidemiology of oral diseases inform the design of the dental curriculum of a new dental school (10, 11). However, this necessarily calls for the formation of a dental professional capable of bridging the increasingly large gap that results from the continued polarisation of the dental treatment needs.

In this article, we suggest that traditional dental education, with its premise based on fully trained dentist doing ‘everything’ including understanding genomics, proteomics (12) and practice-based organisation of dentistry, conflicts with the 2020 Global Oral Health Objectives – namely to

1. Reduce mortality and morbidity from oral diseases;
2. Promote sustainable and priority-driven programmes based on evidence;
3. Develop accessible and cost-effective control and prevention of oral disease;
4. Promote social responsibility and ethical practice; and
5. Reduce oral health disparities within and between populations.

Several of our ‘diagnoses’ corroborate those made in the FDI Vision 2020 documents (3, 4), but we find that the whole ethos and philosophy of dentistry are too focused on a downstream, patient-centred, curative and rehabilitative approach to oral diseases (13) that grants a primary role to the fully trained dentist for population’s oral disease control and prevention. This is a role for which they may be neither adequately trained nor suited to perform, driven as it is by the marketplace inherent in the small business model of dental practice.

We will present a case story from a Danish community to show that it is possible to dramatically alter the oral health profile of children and young adults within a few years by the use of the simple ‘caries control concept’ (14). These findings indicate that it is necessary to radically change the way in which oral health care is provided that can ensure that we can achieve a functioning natural dentition from cradle to grave for all members society. This reorganisation involves the development of a new type of dental health professional capable of carrying out cost-effective and

Table 1. Ten global oral health objectives for the year 2020, FDI (2)

<table>
<thead>
<tr>
<th>No.</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To reduce mortality from oral and craniofacial diseases</td>
</tr>
<tr>
<td>2</td>
<td>To reduce morbidity from oral and craniofacial diseases and thereby increase the quality of life</td>
</tr>
<tr>
<td>3</td>
<td>To promote sustainable, priority-driven, policies and programmes in oral health systems that have been derived from systematic reviews of best practices (i.e. the policies are evidence-based)</td>
</tr>
<tr>
<td>4</td>
<td>To develop accessible cost-effective oral health systems for the prevention and control of oral and craniofacial diseases using the common risk factor approach</td>
</tr>
<tr>
<td>5</td>
<td>To integrate oral health promotion and care with other sectors that influence health</td>
</tr>
<tr>
<td>6</td>
<td>To develop oral health programmes to improve general health</td>
</tr>
<tr>
<td>7</td>
<td>To strengthen systems and methods for oral health surveillance, both processes and outcomes</td>
</tr>
<tr>
<td>8</td>
<td>To promote social responsibility and ethical practices of caregivers</td>
</tr>
<tr>
<td>9</td>
<td>To reduce disparities in oral health between different socio-economic groups within countries and inequalities in oral health across countries</td>
</tr>
<tr>
<td>10</td>
<td>To increase the number of healthcare providers who are trained in accurate epidemiological surveillance of oral diseases and disorders.</td>
</tr>
</tbody>
</table>
evidence-based oral disease-control programmes. We believe that time has come to lay to rest the idea of the omnipotent dentist who is supposedly expert not only in the implementation of effective population-based oral disease control but also in subspecialties such as implantology, prosthodontics, periodontology, orthodontics, endodontics, clinical oral physiology, oral pathology, oral medicine and oral surgery, disciplines that have developed to a level in which comprehensive, demanding and compartmentalised dental education has already evolved.

**Trends in population’s oral health**

Dental caries continues to be the major oral disease responsible for oral discomfort and tooth loss even into old age (15–21). While we do not discount the contribution of periodontal diseases, developmental anomalies, oral mucosal and osseous diseases, it remains a fact that caries and its sequelae, pain, tooth loss and edentulism, have been estimated to account for 93–98% of the oral disease burden across the different regions of the world (5). At the same time, there has been a strong trend for a decline in the prevalence of dental caries prevalence documented for many diverse populations across all continents (22–29). This decline is evident even among children in parts of the world where increases had been predicted (23, 25, 30). There is now clear evidence that caries decline is also occurring amongst young adults and the middle aged (31–37).

Even though periodontal diseases account for a minor part of the oral disease burden in populations (5), a decline in their prevalence and extent is also evident in many populations (32, 38–42). There have been reports of greatly improved oral hygiene conditions (39, 43). The pronounced trend for increased tooth retention has been found to result in maintaining or perhaps slightly increasing the prevalence of the most severe manifestations of periodontitis (39, 43). This most likely reflects both the adoption of more conservative approaches to the treatment of periodontal diseases and a possible diminishing progression rate of periodontal disease.

**Dentistry and oral health of populations**

Dental professionals tend to attribute the decline in caries as the result of their own preventive efforts, in particular to the widespread use of fluorides. We believe that this is not the full story. The rapid uptake of fluoride toothpaste was predominantly brought about by massive advertising campaigns run by the toothpaste manufacturers. Fluoridated toothpastes were introduced to the Danish market, for example, in 1963, and within a year, they held a market share of 30%, and by 1968 had increased to 80%, to reach 95% around 1980 (44). We will argue that the greatest influence for the change in caries levels has been the result of dentists being urged to change their restorative treatment practices. The combination of a significant caries decline together with greatly increased tooth retention has also diminished the occurrence of dental conditions that require high-tech interventions.

One consequence of this is that it is likely that dentists, who are primarily trained to intervene using air rotors, composites, metals and ceramics, will opt to increasingly engage in the marketing and selling of expensive oral trinkets to people with dentitions that are only marginally less than perfect (45). As has repeatedly been pointed out (45, 46), restorative work will eventually fail and need further mechanical and invasive intervention. As a result, restorative approaches tend to work against improvements in oral health. Renshaw (45) stated that ‘one of our problems as a profession over the years has been our reluctance to look honestly into the mirror long enough and often enough to see what we are doing and what we have become’. We agree. In the ensuing analysis, we reflect on what we in the dental profession have been and are doing so as to understand what needs to be done if we are to ensure the maintenance of a lifelong functioning dentition for all.

**Dentistry and evidence-based caries control**

The discovery of the effect on caries of fluoride in drinking water (47) resulted in extensive use of fluorides. Several countries embarked on artificial water fluoridation programmes during the 1950s. For decades, fluorides were thought to be most efficient means for caries prevention if applied systemically. This was backed up by the ‘systemic-effect beliefs’ that the cariostatic mechanisms resulted from fluoride being incorporated into the forming enamel (48, 49).
However, laboratory studies carried out by Larsen in the early 1970s (50) showed that fluoride exerts its cariostatic effect predominantly by being present in slightly higher concentrations in the liquid interphase between the tooth surface and the microbial deposits during ongoing pH fluctuations (51, 52). An important consequence of this discovery of the ‘local effect’ was that fluoride became known as an active therapeutic agent that could be used life long in all age groups whenever caries lesions are developing. The concept of caries control using topical fluorides – rather than caries prevention using systemic fluorides – was therefore advanced (6, 7, 14).

Such findings notwithstanding the idea that fluorides worked topically rather than systemically did not gain much ground in many countries. There continue to be claims that ‘if a little fluoride ingestion is good, more is better’ advanced by public health dentists well into the 1980s, just as drinking water fluoridation continues to be propagated in a number of countries (53–55). While many proponents of drinking water, milk or salt fluoridation now recognise that fluoride exerts a local cariostatic effect (56, 57), the systemic use of fluorides is still advocated (54, 57). Although most now recognise that dental fluorosis is an unwarranted side effect of ingestion of fluoride (58, 59), this side effect is typically downplayed with arguments that the resulting dental fluorosis is not ‘aesthetically objectionable’ (57). But it is precisely concerns about dental fluorosis that have led to recommendations in the USA and in Ireland to reduce the water fluoride content in drinking water from 1 ppm to 0.7 ppm (58, 60). The principal argument for maintaining drinking water fluoridation in these populations is related to concerns over the caries levels among the less affluent and socially disadvantaged groups within the population (55, 59). However, in view of the ongoing caries decline, we would suggest that a much more appropriate approach would be to redirect disease-controlling healthcare resources from the middle and upper classes, whose needs are already well catered for (55) in the current model of practice-based dentistry, to the socially deprived populations who continue to carry the major oral disease burden. This clearly necessitates a different approach to the organisation of health care. It requires that the oral healthcare workforce must meet people where they are.

Drinking water fluoridation requires a sophisticated infrastructure, and this has led some to consider other vehicles for systemic fluoride exposure such as fluoridated salt (56) and fluoridated milk (57), especially for those populations that have no access to public water supplies. However, the evidence for a caries-reducing effect of fluoridated salt and fluoridated milk is scant. It seems contradictory to attempt to deliver the supposed cariostatic benefits of fluoride ingestions via salt when its consumption should be curtailed to reduce the possible risks of hypertension.

The decline in caries noted in many populations has prompted investigations into the effectiveness of various fluoride regimens, both local and systemic. Heidmann et al. (61) demonstrated that fortnightly fluoride rinsing programmes for school children in the Danish public dental care system were no longer cost-effective as a result of the ongoing caries decline. In Europe, most of the artificial water fluoridation programmes were terminated during the 1970s and early 1980s, although generally not due to concerns over dental caries reductions or dental fluorosis incidence, but often following court decisions ruling drinking water fluoridation illegal. Even so, results from the best-documented water fluoridation programmes in Europe showed that there was no longer a difference in caries experience between the fluoridated and non-fluoridated areas in the Netherlands (62, 63). On changing from water fluoridation regime in the Netherlands to a fluoride tablet programme, all that resulted was that dental fluorosis prevalence increased. The expected effect of the fluoride tablets on caries experience could not be demonstrated. Similarly, in 1990, Brunelle and Carlos (64) reported that the USA national data showed a relatively minor difference of about 17% in the caries experience of populations between fluoridated and non-fluoridated communities.

The cariostatic effect of fluoride in toothpastes is well documented (65, 66) and is considered by many as the most likely explanation for the substantial caries reduction observed in many parts of the world (67, 68). However, the levels of reductions in caries experience observed cannot be wholly attributed to the effect of fluorides: broader socio-economic changes may play a significant role not only for caries reductions (69, 70) but also for overall improvement in the population’s oral health status including increased tooth retention and improved periodontal conditions (71).
Dentistry and the need for restorative treatment

The dental profession’s contribution to caries decline appears to be mainly related to changes in the criteria employed for making operative treatment decisions. This has led over the years to a greatly reduced propensity for restorative intervention.

Heidmann et al. (72) examined the effect of changes in the restorative treatment strategies over a 6-year period in two cohorts of 17-year-old Danes for whom bitewing radiographs were routinely taken as part of the final Public Dental Service examination. Gimmesstad et al. (73) examined the changes in restorative treatment decisions by randomly selecting approximately 5% of all Public Dental Service records for 15-year-old Norwegians in each of the years 1979, 1989 and 1996. They found that bitewing radiographs were almost always taken routinely: only 8% of the 1979 and only 3% of the 1996 records had to be excluded owing to missing or unreadable bitewing radiographs or due to incomplete treatment. As Figs 1 and 2 show, the tendency of dentists to intervene with restorative treatment for a given radiograph depth of demineralisation reduced significantly over time in both populations. Operative treatment for demineralisations that were confined to enamel only ceased. Restorative treatment for lesions in the outer dentin were also greatly reduced in the Norwegian population and almost totally disappeared in the Danish cohorts. As a result, the amount of restorative treatment was reduced over time to <20% of what it would have been had the previous restorative thresh-

Fig. 1. The proportion of lesions treated restoratively according to radiographical caries lesion depth among 17-year-old Danes in 1978–1979 and 1984–1985, respectively. Data from Ref. 72.

Fig. 2. The proportion of lesions treated restoratively according to radiographical caries lesion depth in 1979, 1989 and 1996, respectively, among 15-year-olds from Oslo, Norway. Data from Ref. 73.

Fig. 3. The number of lesions observed among 17-year-old Danes in 1984–1985 that were actually treated operatively, respectively, would have been treated operatively had the 1978–1979 restorative treatment decisions still been applicable. Data from Ref. 72.

Fig. 4. The number of lesions observed among 15-year-old Norwegians in 1996 that were actually treated operatively, respectively, would have been treated operatively had the 1979 restorative treatment decisions still been applicable. Data from Ref. 73.
tions in teeth showing demineralisation on the radiographs. As restorative treatment decisions were largely based on the radiographical appearance alone (74), they have had a profound influence on the apparent caries decline, as shown in Fig. 5.

Caries-related treatment decisions made by dentists are based on a process of pattern recognition (75), that is, scripts that lead to ‘this-kind-of-lesion-needs-this-kind-of-treatment’ decisions. Restorative treatment decisions made on the basis of bitewing radiographs are based on two kinds of scripts: the first one is where the presence of a deep demineralisation zone signifies the presence of cavitation and therefore requires mechanical intervention and the insertion of a filling. The second one is based on the idea that the observed demineralisation is likely to progress and will eventually result in cavitation if restorative treatment is not provided, and so restorative treatment is therefore performed to ‘arrest’ the lesions that have not (yet) cavitated (76). It seems that the propensity to intervene restoratively where there is demineralisation that is confined to the enamel, observed in both Danish and Norwegian populations in the late 1970s (72, 73), was an expression of a desire for ‘pre-emptive’ strikes – intervention to prevent the advance of caries. It is likely that these scripts may have been valid in the middle of the twentieth century when caries was abundant, its progression was thought to be rapid, and dentists were hard-pressed to meet the needs for pain relief and rehabilitation. But such scripts have now been invalid for decades. Studies were already published in the mid-1980s (74, 76) showing that less than half of all radiographical demineralisations extending into dentin were associated with cavitation. A large proportion of the fillings provided in a child population in Denmark in the early 1980s represented overtreatment resulting from treatment decisions based solely on bitewing radiographs. More recent studies from other populations have confirmed these findings (77–79), and it is quite likely that the diagnostic value of bitewing radiographs for caries lesion detection in contemporary populations is greatly exaggerated.

It was recently shown (80) than when appropriate visual-tactile criteria are used for caries detection, there is no additional value gained from bitewing radiographs. In fact, reliance on the bitewing radiographical findings would result in overtreatment (80). Unfortunately, dentists generally earn their living from payments for operative treatment and associated diagnostic procedures such as bitewing radiographs. Treatment decisions based on bitewing radiographs are therefore likely to remain a cornerstone in traditional dental practice.

Dentists either do not appreciate or simply elect to disregard the fact that once a tooth has been restored, irrespective of the size of the initial restoration, a cycle of re-restorations has commenced (81). It is known that restorations have a rather limited survival (82). Restorative treatment creates new problems of maintenance and re-restoration of restored teeth (46, 81). Indeed, the placing of restorations does not constitute disease control: it constitutes a deficient method for repairing the signs and symptoms of disease. It is therefore hardly surprising that after a few years, the perceived presence of secondary caries or morphological discrepancies at the restoration margins (81) is used to justify the replacement of the filling. In doing so, the cavity becomes extended/modified/enlarged (83) – and there is a great risk that the restorative cycle will result over time in pulp involvement and periapical inflammation. This, in turn, leads to extensive endodontic treatment, and crown and bridgework, all of which are also associated with rather modest long-term prognoses (84–87). Moreover, each cycle of re-restoration carries with it a considerable risk of iatrogenic damage to neighbouring teeth (88–91). Ultimately, the teeth are at risk of being extracted (46), creating a space for an implant. While this may serve the financial interests of cottage practices, it is difficult to see how it serves the interests of patients or society at large.

Fig. 5. The mean DMFS in Danish 12-year-old children from 1974–1990. Around 1980, the Departments of Cariology and Restorative Dentistry at the two Danish dental schools gave intensive courses on diagnosis and treatment of dental caries to the public dental service dentists. Data from the Danish Health and Medicines Authority.
The bottom line is that the surgical approach to the treatment of biological phenomena using amalgams, composites, gold or ceramics stands little chance of contributing to the maintenance or improvement of oral health in populations (92). In some populations, the evidence might be interpreted to indicate that continued reliance on surgical restorative approaches to biological problems, approaches that remain deeply ingrained in the backbone of dentistry, may actually prevent oral health improvement. Certainly, the caries decline that followed the changes in the restorative treatment propensity of the dentists caring for Danish and Norwegian youths (72, 73) has been not only sustained but continued to this day (Figs 6 and 7).

A case study from the Odder Municipal Dental Service, one of the 98 Danish Public Dental Service units, is illustrative of the reality of the problems outlined above. The solutions that were implemented in this study provide important insights into the alternative avenues for the future if the goal is to ensure that people are able throughout life to eat, speak and socialise without discomfort, pain or embarrassment with their full dentitions intact (93).

Odder Municipal Dental Service – a case story

The Odder Municipality, Denmark, has about 21 500 inhabitants predominantly belonging to the middle-class strata of society. The population of 0–18-year-olds, who remain the key target group for the Municipal Public Dental Service, comprises about 5000 children and adolescents. However, public dental services are also offered to about 110 elderly persons with disabilities and about 40 persons with disabilities or leaning difficulties. The services comprise diagnosis, prevention and oral rehabilitation as well as orthodontic treatment. The latter is currently provided to approximately 25% of all children. Dental services are delivered by a total of 3·3 dentist person-years, 3·3 dental hygienist person-years and 10·1 dental assistant person-years. The staff is organised in teams placed in two separate dental clinics, and a Chief Dental Officer assisted by two dental assistants coordinates the entire dental service programme.

Figure 8 presents the average DMFS for the years 1999–2011 for the 18-year-olds served by the Odder
Municipal Public Dental Service compared with the national average for 18-year-olds. Before 2004, the caries experience in Odder Municipality was well above the national average. This was troubling as the socio-economic profile of the population suggested that much lower caries levels should prevail.

A newly appointed Chief Dental Officer began an analysis of the dental records of the children with the highest caries experience. It became obvious that these children had predominantly been treated restoratively, and there were no indications in the records of oral hygiene instructions, dietary counselling or advice regarding the use of fluoridated toothpastes. For example, a 16-year-old girl with a DMFS of 24 had a total of 90 prior visits to the dental clinic on record. In 38 of these clinical sessions, she had been subject to restorative treatment, while 40 sessions had comprised examinations. Two primary molars had been restored nine times each before eventually being extracted. Another example concerned a 6-year-old boy found to have a defs of 44. He had been seen in the clinic on 52 occasions, and 30 of these had involved restorative treatment, while the remainder involved clinical examinations. Two primary molars had been restored eight times each before being extracted.

The analyses of these dental service records led to the conclusion that little had apparently been done to interfere with the ongoing disease processes except for the excavation of new caries lesions and their repair with failing restorations. Moreover, it was also observed that the focus on restorative procedures often, and not surprisingly, resulted in anxiety about dental care among the children. This restorative approach to caries-active children was deemed unsuitable, and it was therefore decided to set up new strategies for the municipal dental services based on the current knowledge about caries control (6, 7). The following goals were set:

1. In every age cohort, the percentage of caries-free children should increase every year, and the average defs/DMFS should continue to decline and be below the national values.

2. At the age of 18 years when children leave the Public Dental Service, they should have only sound teeth or at the most a few fillings. They should also have been trained in and have developed good oral hygiene habits. They should know about healthy eating and drinking habits. There should be no dental anxiety.

To achieve these goals, the role of each member of the dental team was redefined so as to achieve the most cost-effective use of the resources: The dentists became team leaders and consultants, who perform traditional restorative care only when needed. The dental hygienists became the key care providers as they had been given responsibility for most of the dental examinations. They have been taught to ‘assess risk’ by carefully identifying the earliest visual-tactile signs of caries lesion formation and to place emphasis on the monitoring of children’s oral health habits. The dental hygienists have also been granted permission to perform abrasive adjustment of inaccessible approximal areas between deciduous molars to allow for optimal oral hygiene procedures performed by the child and the parents. The dental assistants have been given an important role in caries control as they have had their own patients assigned and been given responsibility for oral hygiene instructions, topical fluoride applications, sealing of surfaces when needed and care for dentally anxious children.

The dental care programme for children in the Odder Municipality now commences when the child is one and half to 2 years of age. At this age, children and parents are invited to the first meeting with the Public Dental Service. A hygienist or a dental assistant conducts an interview and instructs parents with a focus on the importance of oral hygiene (tooth brushing with a fluoride-containing toothpaste and dental floss) and appropriate dietary and feeding habits. It is stressed that parental participation in the visits to the clinics is important and is expected to continue until the child is about 12 years of age. All communication with children and parents is based on the concepts of appreciative enquiry (94, 95).

All children are invited for dental examinations at 20-month intervals. At each examination, a ‘caries risk assessment’ takes place based on: an assessment of the oral hygiene situation (a disclosing solution is used); presence of signs of early caries lesions in enamel; the child’s past dental caries experience; dental caries experience amongst any siblings; and the stage of eruption of teeth. Based on this assessment, a caries control plan for the individual is developed. The elements of this plan consist of support for improved oral hygiene through plaque control and recording of the plaque index, tooth brushing instructions (tooth brushing twice a day with a fluoride toothpaste is recommended) and use of dental floss (recommended use twice a week); additional topical
fluoride treatment, fissure sealing and dietary counselling may be used according to the individual needs. The time interval between these disease-controlling visits is variable, depending on the response of the child. Importantly, children, who are not considered to be ‘at risk’, are recalled only after 20 months.

When leaving the Public Dental Service, typically at the age of 18 years, each adolescent is carefully informed about his or her oral health status. As the adolescent is (by law) required to choose a private dentist, the chosen private dentist is subsequently provided with an account of the adolescent’s past disease experience and the treatment instituted in case of active caries lesions. If sequential bitewing radiographs are available, they are also provided so that the private dentist will know caries lesions have progressed (or not progressed!) in the more recent past.

The results of this dental health programme have been dramatic (Figs 9–11). From 2005 to 2012, the average DMFS among the 15-year-olds reduced from about 3 to <1 (Fig. 9). In fact, a mean DMFS of 1 was the goal set for the 15-year-olds for the year 2015, and this goal was already reached by 2011, when the percentage of caries-free children at the age of 15 years exceeded 60%.

For the 18-year-olds, the average DMFS dropped from 5.5 in 2005 to 1.7 by 2012 (Fig. 10), and more than 50% of the 18-year-olds left the Public Dental Service in 2012 with a sound dentition, and only 12% had a DMFS of more than four (Fig. 11). The higher-than-national-average caries levels have been turned into caries levels that are lower-than-national-average caries levels (2012 All Denmark: 3.7; Odder: 1.7) (Fig. 8).

In addition to these quantitative results, questionnaire-based surveys have shown that parents and children now consider the municipal dental health-care system as being very supportive and positive, and this adds to the impression among members of the dental teams of a successful joint mission. Parent and child satisfaction has increased to 97–99%, and the entire dental team has a positive perception of the working conditions and the shared responsibility for children’s care.

## Evidence-based oral health care and the dental profession

The contribution of the dentists in explaining the caries decline appears to be modest (70, 96) and primarily related to changes in treatment philosophies (71,
towards less interventionist approaches. Ekstrand et al. (96) observed that the greater caries decline among the Danish Municipal Public Dental Services was found in municipalities where specific goals had been set and where the Chief Dental Officer had a strong focus on caries prevention. Our case story from Odder Municipal Dental Service confirms that it is indeed possible to substantially change the caries situation to the better in just a few years using the principles of caries control. Hausen et al. (97–101) conducted a randomised controlled clinical trial among Finnish children and showed that the concept of caries control worked much better and more cost-effectively than the traditional dentist-centred and largely operative approach to children’s oral health.

As one would expect, dentists do what they are trained to do and for which they are remunerated. Unfortunately, this introduces a heavy bias towards operative dentistry and the provision of surgical solutions to biological problems (92). The major oral diseases will not be conquered using air rotors (45), but by disease-controlling interventions based on biologically sound principles (92), a task for which the traditional, fully trained dentists are not the best equipped. Dentists are not cost-effective for oral disease control, and they hold a ‘competence’ profile that is out of proportion with the oral healthcare needs of major sections of our populations. The problems that will emerge if we maintain the current oral healthcare structure in which ‘only the dentist is the competent and responsible leader of the dental team’ (4) and ‘fully trained dentists [……] retain full responsibility for diagnosis, treatment planning and treatment’ (3) have been identified by some (8, 45, 46, 92, 102), but are, for obvious reasons, quite likely to be largely disregarded by the dental profession itself.

As a consequence, our patients as well as society at large, including decision-makers, remain oblivious to the problems and continue to consider traditional dentists a sine qua non to cover the need for treatment and rehabilitation resulting from the unfortunate consequences of ‘inevitable’ oral disease progression. While the dental profession has a strong self-perception as a free and liberal profession with a well-established code of ethics and a sense of social purpose (103), the reality is that it remains detached from the public health aspects of its profession (104–106). The fee-for-service payment model reinforces the bias towards overtreatment (92) and unnecessary care (104) delivered to those with the lesser needs, while the less privileged groups who account for the major oral healthcare needs remain unserved or underserved (106).

The dentist remains a technically skilled precision mechanic, able to provide highly complex restorative care, but often with limited insight into the underlying biological, cultural and social issues related to patient’s and population’s oral health care. The profile of dentists (107), the profession’s predominant organisation (8) and dentist’s cost-effectiveness profile make them ill-suited to remain the central oral healthcare provider (OHCP) for the future. Oral disease profiles are rapidly changing, and the care for the un- or underserved is unlikely to become a concern for the traditional dentists at large under the present structure and organisation of oral healthcare services.

The dental profession: where we came from

Dentistry has evolved from its cottage industry roots to become a health profession with a university-based education. Until the middle of the twentieth century, dental education largely consisted of technical training in the clinical disciplines: restorative dentistry, endodontics, prosthodontics, oral surgery and orthodontics. Related to these overriding clinical disciplines were Dental Materials, based on the concept that to perform good clinical treatment in any of the disciplines, a thorough knowledge of dental materials sciences was a must. However, a growing appreciation that oral health and disease are integral parts of general health and disease led to a change in the dental curricula in many countries with strong dental societies, and dental education became more ‘biologically’ oriented towards including basic sciences (8). The training period was extended to 5–6 years, comprising a 2-year preclinical training in subjects such as Anatomy, Histology, Embryology, Physiology, Microbiology, Biochemistry and Pathology followed by extensive training in the clinical disciplines. This reflects the traditional fragmented and compartmentalised educational model, which holds that the students are themselves able to integrate discipline-specific knowledge and make the necessary correlations between theory and clinical practice and between academia and society. However, the result has been tunnel vision (8) and an undue focus on the technical and quantitative aspects of dentistry.
aspects continue to be taught by ‘master’ clinicians, typically part-time private practitioners with a weak appreciation of the need for health care in the population at large. Training takes place in dental school clinics where patients are viewed as educational material for students (108) rather than members of the public whose oral health needs should be catered for. Students are typically assessed by counting the number of specific procedures carried out in these patients rather than by evaluating the health outcomes of the care provided to the patients. Once graduated, the highly dominant practice-based fee-for-service model of oral healthcare provision only serves to reinforce the focus on the number of technical procedures carried out, and it is no wonder that the dentists will be out of touch with the need for oral health in the populations they serve.

The middle of the twentieth century saw the subfractioning of the clinical disciplines. Departments of Pedodontics, Periodontology, Community Dentistry, Endodontics and Occlusion were created. This development inevitably sparked a move within each of these subdisciplines to create special postgraduate ‘specialties’ in order to demonstrate the importance of these subdisciplines for an ‘optimal’ dental healthcare service provision to individual patients. This somewhat haphazard subdiscipline, and specialty budding has resulted in a profession with ineffective interdisciplinary communication and weak relations to other healthcare professionals, whether in practice or in public institutions (8, 102, 109).

The oral healthcare profession: where we should be going

In most populations, people now live much longer healthy lives (110). For still a few decades, we will therefore experience a growing number of elderly who retain an increasing number of teeth resulting in dentitions in need of complex treatment. These cohorts represent the result of the ‘restorative era’ of the dental profession. Looking beyond this peak point of complex high-tech rehabilitation needs among the oldest sections of our populations, we see new cohorts growing old, who will have a much lower need for advanced dental treatment because they are the children of the ‘disease-control era’. Already now we can follow these young- and middle-aged cohorts and see that each of these continue to have less caries and less periodontal disease and retain more teeth with fewer and smaller restorations than the immediately preceding cohorts. In most high-income countries, substantial fractions of young- and middle-aged cohorts are unlikely to ever develop a treatment need that matches the competencies of the ‘fully trained dentist’.

Many before us have reflected in depth on the need for action from responsible dental educators and academic leaders on the different components of oral healthcare provision. While most have discussed a need for adjustments of the dental curriculum in response to rapidly changing oral disease patterns (8, 102, 106, 108, 111), or a perceived need for expansion of the dental specialist training (112), few (107) have addressed the structure and organisation of the oral healthcare system as a major obstacle for achieving a functional natural dentition for life for all. Tomar and Cohen (107) emphasised the urgent need to integrate oral health care into general health care, and we think that their ‘diagnosis’ of the problem in the USA covers much broader scenarios. They stated that ‘in the coming decades, the US population will continue to shift toward an older age distribution and an increasing number of Americans will reach their golden years with relatively intact dentitions, chronic disease, and multiple medications. [...] Because of the tremendous overlap of risk factors that threaten oral health and those that increase the risk for other chronic diseases, an integrated system may be able to reap broader benefits from health promotion and disease prevention’ (107). It is now painfully evident to those with a zest for the health of the public that the current practice-based approach to dental treatment and rehabilitation in individuals represents a cul-de-sac from a social, ethical and cost-effectiveness point of view. The ideal oral healthcare system cannot be achieved through minor adjustments of the dental curriculum, or of the number of dental specialties, the payment systems or the solo-practice-based delivery system. In our view, it necessitates a more profound break with long-standing traditional thinking in dental education and in oral healthcare delivery organisation.

Currently, the traditional ‘fully trained dentist’ is complemented by a varying number of dental specialties, which may include orthodontics, oral surgery, periodontics, oral pathology, pedodontics, prosthodontics, endodontics, dental radiology, occlusion and TMJ, and dental public health (111, 112). We suggest
that time has come to realise that this dental workforce should be replaced by two new types of dental professionals: the OHCP, who will comprise the vast majority of the group of dental professionals, and the oral clinical specialist (OCS).

The OHCP should be at the centre of health services to meet the needs of most individuals, families and communities and address the healthcare needs in all age groups with principle focus on evidence-based diagnosis and oral disease control. The OHCP is cost-effective health professional who has a profound understanding of oral disease control and oral health as part of general health and well-being and who is willing to cope with social needs in a critical, creative and pertinent way.

The OHCP should be competent and skilled not only in the diagnosis and control of oral diseases, but importantly also in public health, basic health economy, management and communication. A major role of the OHCP is to lead teams of oral health personnel, which may include auxiliaries/dental assistants/hygienists/therapists according to the particular fabric for each country, at community level, and to plan health care and set priorities at community level involving all age groups, including all the currently un- or underserved groups in the community. Their activities should be integrated into the general health-care services. The OHCPs and their staff will be able to cater for the oral healthcare needs of the large majority of the population. The OHCPs and their staff should therefore be the gatekeepers with respect to advanced oral healthcare needs, just as their services should be integrated into the general healthcare system. The OHCPs will also when needed be able to perform simple restorative treatments.

A number of individual patients will remain, however, who are in need of more oral advanced care including complex rehabilitation. These patients are increasingly likely to belong to the growing fraction of older people with chronic diseases and multiple medications. We need a new cadre, the OCS, to cater for their needs. To ensure that complex oral care for individuals with chronic diseases and multiple medications becomes integrated with general health care, we suggest that the OCS is a medically trained person who has a comprehensive postgraduate training in one of three different clinical specialties: Oral Rehabilitation, Oral Surgery and Medicine, or Orthodontics.

Many of the arguments developed here may, at a first glance, seem to apply primarily to the industrialised countries with a well-developed healthcare system. However, our experiences from Africa, South-East Asia, China and South America have convinced us that one of the worst things that could happen in many of these countries would be the uncritical attempt to replicate the oral healthcare systems prevailing in Europe and North America. In this context, we would like to cite a previous publication (93): Broadly speaking, the oral disease profile of populations in low-income countries in Africa, China, Southeast Asia and South America are typically characterized by a relatively low occurrence of caries, poor oral hygiene conditions, widespread and severe gingivitis, and considerable periodontal breakdown, which, however, does not result in major tooth loss endangering a functional dentition, except for a sub-fraction of the population. The existing oral health care services are often rudimentary, and the challenge for such countries is to avoid the implementation of dental services based on the high-technology clinical approach well known from the Western high-income countries. Unless regulatory steps are taken it is easy to foresee that private initiatives in case of socio-economic growth will result in such services. In the early phase such private enterprises will serve only the relatively small, but affluent, subgroup of the population that can pay. Gradually, the next phase is entered where the existing services are too limited and the economic means of the general population too small to be compatible with dental treatment and the disease affected teeth are therefore extracted. Provided economic growth continues, the third phase is characterized by the dental services gradually approaching the contents and extent well known from the high-income countries in the hey-days of restorative dentistry. Increasing availability and access to classic dentists as they are known from Europe and North America would thus have deleterious consequences. As classic dentistry will not give priority to disease control based on biologically sound principles, we surmise that one of the worst things that could happen in many of these countries would be the uncritical attempt to replicate the oral healthcare systems prevailing in Europe and North America. In this context, we would like to cite a previous publication (93):
and Cohen (107), we acknowledge that the present analysis and the suggestions made here may meet substantial opposition for a range of reasons. However, we really think time has come not only to ‘look honestly into the mirror long enough and often enough to see what we are doing and what we have become’ (45), but also to begin to do something about it.

Acknowledgment

The study was partly supported by a grant from the Bagger-Sorensen Foundation. The authors have no conflict of interests declared.

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It Takes a Team

How New Dental Providers Can Benefit Patients and Practices
DECEMBER 2010

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ACKNOWLEDGMENTS

We would like to thank our Pew colleagues—Aidan Russell, Denise Wilson and Nancy Augustine—for their review of the Productivity and Profit Calculator and how it was used to test the dental practice scenarios in this report. We thank Kathy Litzenberg for assistance with copy editing. And we also thank these Pew staff who made significant contributions to this report: Andy McDonald, Sarah Holt, Gaye Williams, Frederick Schecker, Matt Mulkey and Bill Maas.

The calculator used in this report was developed for the Pew Children's Dental Campaign by Scott & Company, Inc., a health care and business management consultancy, principal investigator Mary Kate Scott.

For additional information on Pew and the Children's Dental Campaign, please visit www.pewcenteronthestates.org/dental.

This report is intended for educational and informational purposes. References to specific policy makers or companies have been included solely to advance these purposes and do not constitute an endorsement, sponsorship or recommendation by The Pew Charitable Trusts.

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Introduction

Policy makers in a number of states are considering the creation of new types of licensed professionals who would work with dentists to deliver primary dental care to children and other underserved patients. This report is the first to examine the potential effects of dental therapists and hygienist-therapists—also called allied providers—on the productivity and profits of private dental practices, where 92 percent of the nation’s dentists work.¹

Some dentists are concerned that authorizing new types of dental professionals could negatively affect their businesses. Pew’s analysis, however, shows that most private-practice dentists who hire an allied provider can serve more patients while maintaining or improving their financial bottom line. Importantly, most dentists who add a dental therapist or hygienist-therapist to their team can treat more Medicaid enrollees and still preserve or increase their income. Three representative scenarios in the following pages indicate that even practices focused on preventive care could benefit from employing these new allied providers.

States have pressing reasons to find cost-effective ways to expand the patient capacity of the dental health system. Nationwide, 49 million Americans live in areas federally designated as having a shortage of dental providers.² Limited access is a particular problem for poor children—17 million of them go without care each year³—and is fueled by multiple factors, including low reimbursement rates offered by state Medicaid programs. The imbalance between provider supply and patient demand is likely to increase due to the federal health care reform law enacted in 2010, which will extend dental insurance to an estimated 5.3 million more children by 2014.⁴

Hiring new types of professionals would build on dentists’ experience with dental hygienists. Hygienists are employed by most practices and trained to provide a set of preventive services.⁵ Dentists have learned that having these practitioners on their team means they can devote more of their time to more sophisticated procedures and enhance their practices’ income.
New types of allied providers present dental practices with a similar opportunity. Dental therapists can offer a limited array of restorative services—for example, filling cavities. These practitioners have existed for many years in Great Britain, Canada, New Zealand and other countries, and since 2005 have served in Native Alaskan communities. Hygienist-therapists can be trained to deliver both preventive and restorative care. (See Exhibit 1 on page 7 for a summary of procedures each type of provider could perform.)

As a companion to this report, the Pew Children's Dental Campaign is releasing an economic tool—called the Productivity and Profit Calculator—that evaluates new professionals’ impact in the context of real-world dental practices. Policy makers, advocates and dentists can use this calculator to assess the unique variables from their states or communities to better understand the potential effects of adding allied providers to the dental team.

Pew’s desire to examine and strengthen the dental workforce is not new. Indeed, from 1985 to 1991, the Pew National Dental Education Program invested $8.75 million in strategic planning and curriculum development for six U.S. dental schools.

State policy changes are essential to ensure that today’s unmet need for dental care—and the coming rise in demand created by health care reform—is met by a larger supply of dental professionals. The multiple private-practice scenarios Pew tested demonstrate that states’ authorization of allied providers is a sound strategy that can significantly improve access for low-income patients. By employing these new providers, dentists can create a win-win outcome: making sure that coverage will translate to actual dental care without weakening their practices’ financial stability.

Key Findings

The three scenarios outlined in this report assess how current and new types of allied providers could change the patient capacity and revenues of private dental practices. These providers include registered dental hygienists and two new types: dental therapists and dental hygienist-therapists.

These scenarios were calculated using the Productivity and Profit Calculator, a financial tool created for Pew by Scott & Company, Inc., a California-based firm that works with organizations interested in developing or assessing new business models in health care. Scott & Company developed the calculator in close consultation with a panel of dentists, dental hygienists and dental office managers.6
Allied providers can strengthen the productivity and financial stability of dental practices.

When serving only privately insured patients, all practice types tested—solo pediatric, solo general and small group—increased their productivity and earnings by adding any one of the three allied providers. Solo practices, where most dentists work, saw profit gains of between 17 and 54 percent.

Allied providers can help practices treat more Medicaid-insured patients in a financially sustainable way.

By raising the number of patients served each day, allied providers can make it possible for most existing private practices to care for Medicaid-enrolled patients without sacrificing profitability. This is noteworthy because most dentists do not accept Medicaid patients.\(^7\)

Consider the example of a solo general dental practice in a state with a Medicaid reimbursement rate of 60 percent of a dentist’s fees—a rate that is the 50-state average and is widely cited as a practice’s overhead costs. (As of 2008, 24 states and the District of Columbia offered reimbursements above 60 percent.) When a dental therapist is added to the team and the practice shifts from treating only the privately insured to a patient mix of 80 percent privately insured and 20 percent Medicaid-enrolled, pre-tax profits increase by 6 percent.

Medicaid reimbursement rates play a critical role.

Reimbursement rates that are set too low discourage dentists’ participation in Medicaid and contribute to the access problem for children. As Pew’s analysis reveals, inadequate reimbursements also weaken the financial viability of hiring allied providers.

In scenarios using a Medicaid reimbursement rate of 60 percent a solo general dental practice’s profits rise when hiring a dental therapist or hygienist-therapist and moving from a patient population that is entirely privately insured to one in which 20 percent of patients are enrolled in Medicaid.

By contrast, in scenarios using a rate of 30 percent (as of 2008, only four states had Medicaid rates paying dentists below 40 percent) the addition of allied providers creates productivity gains but not higher earnings. Yet, even in this case, a solo dental practice seeing more low-income patients performs better financially with an allied provider on the team than without one.

Although raising reimbursement rates is difficult during tight fiscal times, research confirms that doing so is a smart investment that improves access. For example, after Alabama and Tennessee raised their rates, the number of enrollees receiving dental care more than doubled.\(^8\)
Introduction

Fully utilizing allied providers is key to realizing productivity and profit gains.

Given their large fixed costs, dental practices need to maintain steady, high patient volume to ensure financial viability. In all scenarios tested, hygienist-therapists—the provider with the broadest scope of services among the three types studied—are better able to generate revenue that covers the costs of their employment and benefits the practice’s bottom line. (For more details on the provider utilization issue, see “The Utilization Factor” on page 9.)

Gains in productivity and profits are more likely to occur if the dental community and state policy makers ensure that allied providers are seamlessly integrated into existing dental practices. Dental education should train dentists to manage a team of professionals and work efficiently with allied providers. States must review their Medicaid policies to confirm that new types of providers can be properly reimbursed for services they deliver. (For more considerations that policy makers should weigh, see “Policy Implications” on page 16.)

Why Access to Dental Care Matters

Children’s dental care—especially in low-income communities—is the most prevalent unmet health need in the United States, and it has real consequences for kids and for our nation. Dental problems cause absences from school, an inability to focus in class, a decline in overall health, worsened job prospects in adulthood, and—in extreme cases—premature death. Moreover, increased demands on public health systems, poor performance in school and lost employee productivity all cost taxpayers in both the short and long terms. For example:

- In a single year, students may miss as many as 51 million hours of school due to dental health problems. In California alone, 504,000 children ages five to 17 were absent at least one school day in 2007 due to a toothache or other dental concern. The state’s kids missed a staggering total of 874,000 school days that year due to dental problems.

- A year-long study of five major hospital systems in the Minneapolis-St. Paul area revealed that patients made more than 10,000 emergency room visits for dental problems, such as toothaches or abscesses, at a total cost of more than $4.7 million.
- Individuals who received inadequate dental care as children often miss work to deal with ongoing oral health problems. An estimated 164 million hours of work are missed each year because of dental issues.\textsuperscript{15}

- A 2008 study of the armed forces found that 52 percent of new recruits had dental problems that needed urgent attention and would delay overseas deployments.\textsuperscript{16}

- Dental problems can hurt a person’s ability to find a job. A University of Nebraska study confirmed a widely held but little-discussed prejudice: People who are missing front teeth are seen to be less intelligent and less trustworthy than people without a gap in their smiles.\textsuperscript{17}

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**EDUCATION AND SALARY OF ALLIED PROVIDERS**

State policy makers considering new dental workforce models must decide what level of education will be required of allied providers. International experience reveals that two or three years of post-high school training is sufficient to produce practitioners with the necessary skills to deliver quality care.\textsuperscript{18}

Given that more education generally results in higher earnings, the Productivity and Profit Calculator uses an allied provider’s salary as a proxy for education.\textsuperscript{19} When setting education requirements, policy makers should be mindful that practitioners who are required to undergo lengthier periods of training or education generally demand higher salaries. Based on the calculator’s analyses, lengthier periods of education will moderately reduce the revenue benefits that dentists would otherwise accrue by hiring new providers.\textsuperscript{20}
How the Calculator Tests the Economics of Allied Providers

The Productivity and Profit Calculator is an economic tool that provides information to help dentists and policy makers understand how adding current and new types of allied providers (with distinct scopes of dental practice, levels of training and amounts of supervision) could affect the revenues and productivity of different dental practices.

The calculator is a model that is intended to gauge the direction and magnitude of the gain or loss to earnings and productivity associated with hiring allied providers. It is intended for illustrative purposes only and should not be relied upon as a business-planning tool to forecast actual profit and loss.

Variables also may be adjusted to account for Medicaid participation or to test a provider model that differs from those presented in the dental practice scenarios. (For more information on how the calculator was developed, see “Methodology” on page 18.)

The scenarios start by assessing the impact a practice experiences when hiring a registered dental hygienist. The calculator includes two new types of providers in addition to a registered dental hygienist. The first is the “dental therapist,” who would be certified to perform a limited set of preventive and restorative services. The second is the “hygienist-therapist,” who would have training necessary for a larger range of restorative and preventive services. These terms reflect the outlines of provider models being explored by states; however, this report is not intended to advocate for a specific type of allied provider. See Exhibit 1, which describes the scope of services performed by each provider.
INTRODUCTION

In practice, allied providers have different scopes of services and go by different names. New providers already are being trained in Minnesota and deployed in parts of Alaska. In 2009, the Minnesota legislature authorized the creation of the bachelor’s-level dental therapist and the master’s-level advanced dental therapist. In 2005, dental health aide therapists (DHAT) began to be deployed to remote Alaska Native communities. DHATs are trained in a two-year program to provide oral exams and preventive services and to conduct basic restorative services and tooth extraction.

Exhibit 1 enumerates the procedures included in the calculator and is not intended as a comprehensive list reflecting the complete scope of care offered by dentists, who may provide other sophisticated procedures, such as root canal therapy or orthodontia.

Exhibit 1

Summary of Dental Procedures Included in the Calculator

<table>
<thead>
<tr>
<th>Category of Services</th>
<th>Procedures Provided by Dentists and Allied Providers*</th>
<th>Dental Hygienist</th>
<th>Dental Therapist</th>
<th>Hygienist-Therapist</th>
<th>Dentist (Owner or Associate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>Oral evaluations</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Radiographs/imaging</td>
<td>Panoramic X-ray</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Preventive</td>
<td>Cleanings</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Sealants</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Restorative</td>
<td>Silver fillings</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Tooth-Colored fillings</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Prefabricated stainless crown</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Temporary filling</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Temporary crown</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Permanent crown</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Endodontics</td>
<td>Pulpotomy**</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Periodontics</td>
<td>Non-surgical services</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Prosthodontics</td>
<td>Complete dentures</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Extractions</td>
<td>Simple extractions of primary or permanent teeth</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

* These are non-technical descriptions of the procedures contained in the calculator. For the technical names of the procedures, as well as the Current Dental Terminology codes they fall under, see Tab 1, “Procedures, Time, Fee” of the Productivity and Profit Calculator.

** A pulpotomy is a procedure for removing infected tissue from a primary tooth.

Scenarios

The Productivity and Profit Calculator has been used to determine the impact of adding allied providers on three types of private dental practices:

1. A solo, pediatric dental practice, with a dentist, two dental assistants and administrative support
2. A solo, general practice, with a staff structure similar to type 1 above
3. A small-group practice with a dentist owner, two associate dentists, six dental assistants and administrative support

Each of these scenarios begins with an overview of the practice being tested—its existing staff, annual profits and approximate productivity. In the baseline case, the practices are assumed to have a primarily preventive-diagnostic case mix, and to not serve Medicaid patients. This baseline scenario is then adjusted to reflect the effect of hiring each of the three different allied providers.

A second set of graphs demonstrates the impact of modifying the patient mix from 100 percent privately insured to a combination of 80 percent privately insured and 20 percent Medicaid-enrolled. Most dentists do not accept Medicaid patients, and shifting their practices to include 20 percent Medicaid patients is viewed as a significant yet realistic shift. In addition, these scenarios measure this effect at varying Medicaid reimbursement rates—both with and without the addition of allied providers.

Additional variations on all practice models were tested to capture the effects of reducing utilization (described in “The Utilization Factor” on page 9).

Although these scenarios are intended to represent the majority of dental practices and the better-known new provider types, those who wish to use the calculator to assess their local circumstances can and should alter the model to more closely approximate the existing dental practices in their area and to test providers with differing scopes of practice.

The calculator was developed in consultation with an advisory panel of private-practice dentists. This panel offered input on the assumptions regarding the procedures included in the calculator, the time required to perform each procedure and the costs related to operating a dental practice (wages, supplies and capital expenditures). Taxes are not accounted for in the model.
The utilization rate—the percentage of working hours spent treating patients—is a variable that significantly shapes the financial impact that an allied provider has on a private dental practice. The data presented in the scenarios were generated assuming a utilization rate of 90 percent—which takes into account time spent on lunch, breaks and administrative tasks, leaving 6.12 hours per day for patient care, 244 working days a year. This utilization rate was chosen because it closely reflects the average utilization rate reported by the American Dental Association for general dentists who operate solo practices.25

Utilization rates may be lower than 90 percent for several reasons. A new practice may take time to develop a regular stream of patients. Missed appointments may create down-time, and economic slumps may reduce the frequency with which patients seek dental care.

Yet, even when working at less than a 90 percent utilization rate, new types of providers can contribute positive financial benefits to a dental practice. A solo pediatric practice serving only privately insured patients sees a 10 to 35 percent improvement over its baseline profit ($320,593) by hiring any of the three allied providers, even if the new practitioner has only a 75 percent utilization rate and the dentist is busy 90 percent of the time.

The utilization rate becomes more critical when the practice serves Medicaid patients, because Medicaid reimbursements ordinarily are lower than dental practices’ usual fees.

States focusing on deploying new allied providers to improve access for Medicaid enrollees must consider methods to help enrollees keep appointments so that dental practices can operate sustainably.

Other scenarios can be tested by adjusting the utilization rates of the dentist and other team members when using the calculator.

Where possible, this information was validated using sources such as the American Dental Association’s Survey of Dental Practice. See the “Methodology” section for more details.

The calculator, step-by-step instructions for using it, complete lists of financial data, variables for each scenario and detailed findings are accessible at www.pewcenteronthestates.org/ittakesateam.
Impact on a Solo Pediatric Dental Practice

Independent dentists, who run the majority of dental practices in the United States, generally concentrate on providing preventive care and are supported by dental assistants and office staff. The calculator tested the effect of introducing an allied provider into this type of practice. The assessment for this scenario was based on a pediatric dentist with a 2,000-square-foot office and four operatories (rooms with patient chairs), two dental assistants, two support staff and appropriate equipment.

This solo pediatric dentist serves the privately insured and generates pre-tax profits of $320,593. The addition of any allied provider yielded higher profits. The practice’s earnings rose 19 percent when a dental hygienist was hired, 29 percent when a dental therapist was added and 54 percent when a hygienist-therapist was hired.

This practice performs an estimated 10,124 procedures annually, including hygiene, restorative and endodontic procedures. The number of patient-care procedures performed by the practice

---

Exhibit 2

Allied Providers’ Impact on a Solo Pediatric Dental Practice

<table>
<thead>
<tr>
<th>PROFIT IMPACT</th>
<th>PRODUCTIVITY IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$320,593</td>
<td>10,124</td>
</tr>
<tr>
<td>Net Pre-Tax Profit</td>
<td>Total Procedures</td>
</tr>
<tr>
<td>$380,058 +19%</td>
<td>12,384 +22%</td>
</tr>
<tr>
<td>Adding 1 Dental Hygienist</td>
<td>Adding 1 Dental Therapist</td>
</tr>
<tr>
<td>$413,625 +29%</td>
<td>13,170 +30%</td>
</tr>
<tr>
<td>Adding 1 Dental Therapist</td>
<td>Adding 1 Hygienist/Therapist</td>
</tr>
<tr>
<td>$494,918 +54%</td>
<td>15,314 +51%</td>
</tr>
</tbody>
</table>

jumped between 22 and 51 percent when a new provider was hired. Notably, the earnings and productivity gains were greater when the allied provider’s scope of services was greater (Exhibit 2).

- Adding a dental therapist or hygienist-therapist, who can perform some restorative procedures, also enables this pediatric practice to devote up to 20 percent of its time to Medicaid-enrolled patients and still increase its income. In this scenario, Medicaid reimbursement rates are assumed to be 60 percent of the practice’s usual fees.

- A Medicaid rate of 30 percent creates a significantly different outcome than a 60 percent rate. Adding a dental therapist to this pediatric practice can increase profits by 7 percent when the reimbursement is higher, but the practice’s earnings fall 7 percent with a Medicaid rate of 30 percent.27 Regardless of the reimbursement rate, a pediatric dentist’s solo practice fares much worse financially when serving 20 percent Medicaid-enrolled patients without adding a new provider (Exhibit 3).

### Exhibit 3

**Profit Impact on a Solo Pediatric Dental Practice Serving 20% Medicaid Patients**

<table>
<thead>
<tr>
<th></th>
<th>Baseline (No Allied Providers and No Medicaid)</th>
<th>No Allied Providers 20% Medicaid Caseload</th>
<th>Adding 1 Dental Hygienist</th>
<th>Adding 1 Dental Therapist</th>
<th>Adding 1 Hygienist/Therapist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Pre-Tax Profit</td>
<td>$320,593 -25%</td>
<td>$239,796 -16%</td>
<td>$277,705 -13%</td>
<td>$298,126 -7%</td>
<td>$417,268 +30%</td>
</tr>
<tr>
<td><strong>SOURCE</strong>: Pew Center on the States, 2010.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Impact on a Solo General Dental Practice

The second scenario examines a solo general dental practice that serves both adults and children. In general, the findings were very similar to the findings for solo pediatric practices. Operating at 90 percent utilization, this practice saw a profit of about $337,242.

Exhibit 4

Allied Providers’ Impact on a Solo General Dental Practice

<table>
<thead>
<tr>
<th>PROFIT IMPACT</th>
<th>PRODUCTIVITY IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline (No Allied Providers)</strong></td>
<td><strong>Baseline (No Allied Providers)</strong></td>
</tr>
<tr>
<td><strong>Adding 1 Dental Hygienist</strong></td>
<td><strong>Adding 1 Dental Therapist</strong></td>
</tr>
<tr>
<td><strong>Adding 1 Hygienist/Therapist</strong></td>
<td><strong>Adding 1 Hygienist/Therapist</strong></td>
</tr>
<tr>
<td><strong>$337,242</strong> Net Pre-Tax Profit</td>
<td><strong>10,051 Total Procedures</strong></td>
</tr>
<tr>
<td><strong>$395,505</strong> +17%</td>
<td><strong>12,315 +23%</strong></td>
</tr>
<tr>
<td><strong>$428,599</strong> +27%</td>
<td><strong>13,057 +30%</strong></td>
</tr>
<tr>
<td><strong>$511,446</strong> +52%</td>
<td><strong>15,208 +51%</strong></td>
</tr>
</tbody>
</table>

When adding allied providers to this practice, profits increased 17 percent with a dental hygienist, 27 percent with a dental therapist and 52 percent with a hygienist-therapist (Exhibit 4).

Hiring a new provider caused this practice’s productivity to climb between 23 percent and 51 percent, depending upon the new team member’s scope of services (Exhibit 4).

When the practice’s patient mix was modified to include 20 percent Medicaid-enrolled patients, a dental therapist or a hygienist-therapist bolstered the practice’s pre-tax profits in three out of the four instances that were tested. These results were similar to those from Scenario 1 (Exhibit 5).

**Exhibit 5**

Profit Impact on a **Solo General Dental Practice** Serving 20% Medicaid Patients

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Baseline (No Allied Providers and No Medicaid)</th>
<th>No Allied Providers 20% Medicaid Caseload</th>
<th>Adding 1 Dental Hygienist</th>
<th>Adding 1 Dental Therapist</th>
<th>Adding 1 Hygienist/Therapist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Profit</strong></td>
<td>Net Pre-Tax Profit</td>
<td>$254,196</td>
<td>$285,486</td>
<td>$331,842</td>
<td>$357,490</td>
</tr>
<tr>
<td><strong>Net Pre-Tax Profit</strong></td>
<td>30% reimbursement rate</td>
<td>$337,242</td>
<td>$291,067</td>
<td>$311,130</td>
<td>$357,490</td>
</tr>
<tr>
<td><strong>Net Pre-Tax Profit</strong></td>
<td>60% reimbursement rate</td>
<td>$291,067</td>
<td>$331,842</td>
<td>$311,130</td>
<td>$357,490</td>
</tr>
</tbody>
</table>

Impact on a Small Group Practice with Associate Dentists

The small group practice is defined as a single owner-dentist with two or more associate dentists. The associate dentists provide the complete set of dental procedures and are compensated at 30 percent of the fees for the procedures they perform. In this scenario, the office is 4,000 square feet with eight operatories and associated equipment, such as additional sterilization equipment, digital cameras, office computers and furniture. The team includes two dental assistants for each dentist and three office support staff.

**Exhibit 6**

Allied Providers’ Impact on a Small Group Dental Practice

<table>
<thead>
<tr>
<th>PROFIT IMPACT</th>
<th>PRODUCTIVITY IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$801,969</td>
<td>29,632</td>
</tr>
<tr>
<td>Net Pre-Tax</td>
<td>Total Procedures</td>
</tr>
<tr>
<td>Profit</td>
<td>+8%</td>
</tr>
<tr>
<td>$859,516</td>
<td>31,888</td>
</tr>
<tr>
<td>+7%</td>
<td>+10%</td>
</tr>
<tr>
<td>$898,683</td>
<td>32,674</td>
</tr>
<tr>
<td>+12%</td>
<td>+18%</td>
</tr>
<tr>
<td>$979,976</td>
<td>34,818</td>
</tr>
<tr>
<td>+22%</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** Pew Center on the States, 2010.
This practice has an annual pre-tax profit of $801,969 and provides 29,632 procedures per year. Both profits and productivity were enhanced when allied providers were hired by a small group practice whose case mix focuses on the privately insured (Exhibit 6).

When adding allied providers to this practice, profits increased by 7 percent with a dental hygienist, 12 percent with a dental therapist and as high as 22 percent with a hygienist-therapist (Exhibit 6).

When one new provider was hired, the practice saw its productivity rise between 8 and 18 percent, depending upon the new team member’s scope of services (Exhibit 6).

Hiring a new provider and devoting 20 percent of the practice’s patient mix to Medicaid enrollees presented a financial challenge for this business, especially when measured at the lowest reimbursement rate of 30 percent. Yet the addition of allied providers significantly mitigated the economic impact. In a group practice with no allied providers, profits fell 24 percent; with one hygienist-therapist, earnings dropped by only 8 percent (Exhibit 7).

### Exhibit 7

**Profit Impact on a Small Group Dental Practice Serving 20% Medicaid Patients**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>30% Reimbursement Rate</th>
<th>60% Reimbursement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (No Allied Providers and No Medicaid)</td>
<td>$801,969</td>
<td>$801,969</td>
</tr>
<tr>
<td>No Allied Providers 20% Medicaid Caseload</td>
<td>$606,656</td>
<td>$642,925</td>
</tr>
<tr>
<td>Adding 1 Dental Hygienist</td>
<td>$726,059</td>
<td>$768,161</td>
</tr>
<tr>
<td>Adding 1 Dental Therapist</td>
<td>$757,266</td>
<td>$801,969</td>
</tr>
<tr>
<td>Adding 1 Hygienist/Therapist</td>
<td>$830,893</td>
<td>$865,609</td>
</tr>
</tbody>
</table>

Policy Implications

Private practices provide the majority of dental care in the United States. As outlined in Pew’s 2009 policy framework, Help Wanted: A Policy Maker’s Guide to New Dental Providers, states interested in pursuing new types of providers should think carefully about how these practitioners will complement the system. Policy makers should consider the following:

1. The Productivity and Profit Calculator assumes that allied providers are seamlessly integrated into a dental practice. This requires effective collaboration among team members. Dental school curricula should ensure that graduating students have been trained to manage a team of professionals and to work efficiently with allied providers. Continuing education should be offered to practicing dentists to enhance these skills.

2. States that are seriously committed to improving dental care access must ensure their Medicaid reimbursement rates are high enough to cover the cost of care. States that do so will be more successful in encouraging broad Medicaid participation by dentists. It is unrealistic to expect dental practices—with or without allied providers—to accept Medicaid patients if doing so means their practices take a significant loss of profit.

3. State Medicaid programs should ensure that enrollees have the supports they need to successfully make and keep dental appointments. This could include enhancing transportation assistance, offering translation services or providing case management services to help patients navigate the Medicaid system. These and other supports will help dental practices maintain the utilization levels they need to remain profitable.

4. State leaders and Medicaid administrators should ensure that their policies permit reimbursement for services performed by allied providers. Policy makers should review existing rules that cover public and private dental insurance and take appropriate action to address issues that might arise in the billing process.
Conclusion

Hiring an allied provider can make smart business sense for a private dental practice by increasing its productivity and—in the process—meeting the needs of many low-income Americans who currently go without care.

To make these innovations and benefits a reality for patients and practices, states first must authorize allied providers. As policymakers consider new workforce models, this report and the Productivity and Profit calculator can inform their deliberations and proposals.

State leaders, dentists, public health advocates and other stakeholders should be heartened to know that expanding the dental team is an effective strategy to improve access to care, but they cannot overlook the importance of setting adequate Medicaid reimbursement rates. While raising rates is difficult during tight fiscal times, research confirms its positive impact on access, and several states, including Maryland and Rhode Island, have taken this step in recent years despite budget constraints.

As the American Dental Association notes on its website, “for people who live in areas where a dentist is not available or who cannot afford treatment, access to dental care can be difficult.” Shortages of dentists and low Medicaid rates that discourage practices’ participation have serious health, education and economic consequences—consequences felt by millions of families firsthand. With stakes this high, now is the time to welcome new allies to the team.
Methodology

The Productivity and Profit Calculator was developed by Scott & Company, Inc.—a California-based consultancy that works with organizations interested in developing or assessing new business models in health care. The calculator’s purpose is to determine the impact of an allied dental health professional on a private dental practice’s productivity and pre-tax profit. The calculator uses a Microsoft Excel-based model that can be adapted by users to simulate a variety of dental practices, including those presented in the three scenarios of this report.

Scott & Co. consulted with a group of dentists, practice managers, dental hygienists and other practitioners to develop the calculator. In addition, an advisory panel reviewed the project scope, model structure, inputs and findings. (See Advisory Panel members on page 20.)

The expert team guided the creation of the set of procedures that represent those performed in a typical dental practice and that acts as a proxy for the hundreds of procedures conducted within a practice. The team made recommendations on 20 common procedures in eight categories. The model also allows the user to select “Other” as a ninth category, which enables the user to add a specific procedure not found in the standard eight categories.

The expert group provided input on the initial set of fees for each procedure and the time needed to perform them. Fees for each procedure were drawn from the American Dental Association’s 2009 Survey of Dental Fees. Medicaid reimbursements are calculated as a percentage of the practice’s usual fees. The initial Medicaid reimbursement rate in the calculator is 60 percent of usual fees. This percentage is roughly the national average for the state reimbursement rates paid to dentists for five common dental procedures. The calculator uses one “case mix” for the entire practice and assumes that Medicaid-enrolled patients will receive services similar to those received by privately insured patients.

The allied providers’ scopes of practice were based on a 2009 W.K. Kellogg Foundation report. The initial fixed-cost structure was developed under
METHODODOLOGY

the guidance of the expert panel and uses salaries from the Bureau of Labor Statistics and publicly available price lists for equipment, leasing fees and tenant improvements. The model assumes a 244-day working year. The model also assumes that a dentist will spend some portion of the day supervising the allied provider; the value of 30 minutes of supervision time for allied providers was developed in consultation with the advisory group.

Users of the calculator can change all variables (allowable procedures, fees, supervision time and cost structure).

The model includes initial variables, which provide a starting point for users to generate findings. Fees for services, Medicaid reimbursement rates, salaries, equipment costs, leasing fees and tenant improvements vary significantly across the country; users should make adjustments to reflect local conditions.

For instructions on how to use the calculator, please refer to the user manual at www.pewcenteronthestates.org/ittakesateam. A detailed breakout of inputs and outputs for all three scenarios that were tested can also be found at this Web page.
Advisory Panel

This report benefited tremendously from the insights and expertise of an advisory panel and two additional external reviewers. These experts provided feedback and guidance at critical stages in the project. While they have screened the report for accuracy, neither they nor their organizations necessarily endorse its findings or conclusions.

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Endnotes

1 In 2006, there were 164,864 private-practice dentists, out of a total of 179,594 professionally active dentists. See “Key Dental Facts” (American Dental Association, September 2008), 13, http://www.ada.org/ada/prod/survey/publications_free-reports.asp#key (accessed December 7, 2009). In 2007, 73.3 percent of private-practice dentists were sole proprietors. See ADA 2008 Survey of Dental Practice, 5.


4 The estimated number of children who will benefit from the health care reform law comes from Pew Center on the States, Children’s Dental Campaign. Pew used national statistics of the insured and uninsured to determine the number of children (approximately 8 million) who are currently uninsured and who would likely qualify for public health insurance (Medicaid and the Children’s Health Insurance Program), which includes dental coverage, and the state-based exchanges. Pew then used studies from Massachusetts’ health care implementation experience to determine a 66 percent discount rate, allowing for exemptions, and people declining coverage and choosing to pay a fine. See “Distribution of the Nonelderly Uninsured by Age” (Henry J. Kaiser Family Foundation, 2009), http://www.statehealthfacts.org/comparable.jsp?typ=1&ind=134&cat=3&sub=40 (accessed August 17, 2010). See also S. Long and L. Phadera, “Estimates of Health Insurance Coverage in Massachusetts from the 2009 Massachusetts Health Insurance Survey” (The Urban Institute, October 2009), http://www.mass.gov/Eeohhs2/docs/dhcpf/r/pubs/09/his_policy_brief_estimates_oct-2009.pdf (accessed August 17, 2010).


6 The calculator is a model that is intended to gauge the direction and magnitude of the gain or loss to earnings and productivity associated with hiring allied providers. It is intended for illustrative purposes only and should not be relied upon as a business-planning tool to forecast actual profit and loss.


8 A study of six states that raised reimbursement rates for dentists found that provider participation...


20 The calculator assumes new allied providers will be paid a fixed salary plus benefits as opposed to a percentage of the revenues they produce. Associate dentists’ compensation is assumed to be 30 percent of the fees from the services they produce.


27 Pew has found that states reimburse, on average, 60.5 percent of dentists’ median fees for five common procedures. Twenty-four states met or exceeded this benchmark. The worst-performing state has a reimbursement rate of 30.5 percent. See Pew Center on the States, “The Cost of Delay,” 40.


29 Borchgrevink, Snyder and Gehshan, “The Effects of Medicaid Reimbursement Rates on Access to Dental Care.”


31 The model uses the average national fee for each procedure, rounded to the nearest $5. For procedure categories that represent multiple procedures (e.g., denture services), a composite fee is used. See American Dental Association, “2009 Survey of Dental Fees” (2009).


33 The assumption that care is similar across Medicaid and non-Medicaid populations is supported by an Agency for Healthcare Research and Quality study, which found that, “In 2004, approximately 128 million people with at least one dental visit received about 572 million dental procedures in the United States. Approximately 86% of the population with at least one dental visit had at least one diagnostic procedure (examination or X-ray), and about 79% of the population had at least one preventive procedure (cleaning, fluoride, or sealant) during the year. Together, approximately 73% of all procedures were diagnostic (42.5%) or preventive (30.4%) during 2004.” R. J. Manski and E. Brown, “Dental Use, Expenses, Private Dental Coverage, and Changes, 1996 and 2004” MEPS Chartbook No.17 (Agency for Healthcare Research and Quality, 2007), 5, http://www.meps.ahrq.gov/mepsweb/data_files/publications/cb17/cb17.pdf (accessed August 20, 2010).


Access to Oral Health Services for Low-Income People: Policy Barriers and Opportunities for Intervention for The Robert Wood Johnson Foundation

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October 2002
The **National Conference of State Legislatures** (NCSL) serves the legislators and staffs of the nation’s 50 states, its commonwealths and territories, and the District of Columbia. NCSL provides research, technical assistance and the opportunity for policymakers to exchange ideas on the most pressing state issues. NCSL is a bipartisan organization with three objectives:

1. To improve the quality and effectiveness of state legislatures,
2. To foster interstate communication and cooperation, and
3. To ensure states a strong, cohesive voice in the federal system.

**Forum for State Health Policy Leadership**

The Forum for State Health Policy Leadership is an entity within the National Conference of State Legislatures. The central mission of the Forum is to enhance the capacity for informed decision making and leadership within the state legislatures regarding the financing, organization and delivery of health care services to low-income and vulnerable populations. The Forum is designed to provide a range of information, training and technical assistance services to new state legislators who are potential future leaders in health policy and to serve as a mechanism for established leaders in state health policy to further develop and share their expertise.
Executive Summary

The National Conference of State Legislatures contracted with The Robert Wood Johnson Foundation (RWJF) in January 2002 to conduct a study of policy barriers to access to oral health care for low-income people and opportunities for the Foundation to address them. Over an eight month period, NCSL gathered and analyzed information, hosted meetings of national and state experts, and conducted site visits to five states (herein labeled States A through E). The site visits offer a rich portrait of the struggle to improve access in states and communities through conversations with nearly 75 people on all sides of the issue. Definite themes emerged from the site visits and the meetings about barriers that lead to three sets of opportunities for intervention by RWJF.

NCSL has documented multiple policy barriers to access to oral health services that are described in detail under the following sections:

- Supply, distribution and practice patterns of dentists
- Federal and state policy and programmatic barriers
- Dental education
- Research issues
- Leadership
- Advocacy, and
- Public education.

In general, it is much easier for people to identify and describe barriers and harder to generate creative solutions. Those who work on oral health issues seem very much “mired in the present” and are not thinking about bold new solutions. There were a number of things people interviewed for the study did not mention or request that seem like glaring omissions, such as foundation support to:

- Increase the supply of dentists
- Develop a new mid-level practitioner similar to a nurse practitioner or physician’s assistant
- Explore the use of expanded function dental auxiliaries
- Research and report on scope of practice and supervision requirements for dental hygienists and dental assistants
- Research state dental practice acts for restrictions they impose on medical providers delivering dental screening and fluoride treatments, and for the impact of the corporate practice of dentistry
- Improve advocacy efforts on behalf of water fluoridation
- Research and write about dental economics and how they differ from medical economics
- Educate governors or governors’ health staff on oral health
- Engage in leadership development among dental associations or dentists.

The three areas where RWJF investment would be most useful to breaking down policy barriers so states can move forward more forcefully to solve their access problems are:

Defining the Policy Problem

There is much disagreement in states about the nature and dimensions of the oral health access problem. States that have not moved forward need consensus-building activities such as oral health policy academies, task forces and commissions in order to develop a unified vision of the problem at hand. They also need help educating the media and working with the media to raise the visibility of oral health issues, and a broad public education effort aimed at the general public and high-risk groups such as immigrants, Medicaid and SCHIP recipients, low-income mothers and grandparents.
Developing Policy Solutions
Assuming that a common definition of the problem has been accepted, states lack realistic and achievable policy solutions. There are also big holes in the picture; information is not shared for political reasons, not available or not given to people who could use it to make a difference. States need the sort of information that has been available in great quantities to spur the debate over health care reform: policy analyses, program evaluations, cost-benefit analyses, reports on best practices, and surveys to gather state-specific and local information. In particular, they need policy work that can explore alternative practice and service delivery models, new providers and any new ideas that would help open up the dialogue into new ways to solve problems in oral health. This work needs to be coupled with a broad dissemination effort to people in all areas of the policy process.

Build Political Support
Oral health is a low priority for policymakers, most state health officials, advocacy groups and much of the general public. There are very few groups other than state dental and hygiene associations that work with the legislature on an oral health agenda, and they do not move forward together in any sustained fashion. Coalitions on oral health are either absent, missing members from key constituencies, weak, or poorly-funded and managed. Coalitions need training and tools to generate support for change in oral health policy. Even more serious, there is a dearth of consistent, strong leadership on oral health issues in legislatures and state agencies. There is a need for leadership development among legislators, education for legislative staff and support for state dental directors.
I. Supply, Distribution and Practice Patterns of Dentists

Barriers: Supply, Distribution and Practice Patterns of Dentists

Too Few Dentists or Just Enough?

One clear problem in states is the wide disparity of opinions about whether or not there is a shortage of dentists in their states. Most people, particularly those who work for state Medicaid agencies or health departments, safety net clinics or advocacy groups, feel that there is clearly a shortage of dentists in their state. Dental association officers and staff in the states we visited, on the other hand, generally say there is no shortage of dentists, although they are willing to admit there is a geographic maldistribution. State B’s dental association president said “if there was valid scientific evidence of a shortage, we would support more students in existing dental schools, but no new schools.” (The declining number of students admitted to dental school is further discussed in the “Dental Education” section.) In every state visited, people from all sides of the issue cited a maldistribution of dentists, with too few in rural, frontier, border and urban underserved areas to see patients regardless of income. State C has 25 counties without a dentist and State A has 3 counties with no dentists and 15 with fewer than five. About one-fifth of State E’s counties do not have a dentist. It is particularly difficult to get specialty care in rural areas. There is also a tremendous problem attracting dentists to serve Native Americans on reservations.

According to states, any shortage that does exist is likely to be exacerbated in the coming years by the aging of the dental workforce. For example, 40% of State E’s dentists will be retiring in the next ten years. This issue isn’t uniformly understood by people within states as not every state collects this information and the dental associations, which receive the results of the annual American Dental Association surveys, don’t generally release or share the information. State regulatory boards also may have the information but don’t analyze or release it.

Enough Dentists for Whom?

Most people agree that there is a shortage of those who are willing to treat low-income clients, particularly those insured by Medicaid. Some dentists in State D resigned from the Blue Cross Blue Shield network rather than agree to take low-income patients paid for by a foundation’s program. Part of the problem is that most dental practices are already full with patients who pay in cash or have private dental insurance so inadequate capacity exists to care for low-income patients. The president of one state dental association said “dentists don’t feel like they need to see more patients” when asked if expanded function dental auxiliaries would be helpful to solve access problems. Another barrier is dentists’ preconceived notions of what Medicaid patients are like. There is a stigma associated with this population and an assumption—often borne out—that there will be a high no-show rate. A number of people noted that dentists would rather donate care at a clinic than have “them” in their waiting rooms.

In every state, people said there are very few dentists who are willing and able to treat children or adults with special health care needs. Many dentists are taught in dental school to refer disabled patients and young children elsewhere, so they lack the training and comfort level to treat them. In State C, there is a three-week wait for oral health services for children with special health care needs. In State A, many families must drive long distances to the dental school so they delay care until the need is critical because access is so difficult. In State D, a few disabled patients can receive care at a city hospital through the WICHE program (multi-state exchange program that provides slots in professional schools for state residents from states without schools). A fiscal analyst at the legislature said “it would take four years for them to serve the whole disabled population with one dental visit.”
Protecting a Cottage Industry

Another set of barriers is the way dental practices are organized. Dentists by and large are in solo practices. A large percentage don’t accept any insurance, let alone Medicaid, on philosophical or practical grounds, and ask patients with insurance to pay in full and seek reimbursement on their own. A dental educator in State B said, “in continuing education ‘management’ classes, dentists are taught not to accept insurance.”

Many states have a ban on the corporate practice of dentistry in their dental practice act, which prevents dentists from working for any entity other than another dentist. This has been used to prevent the development of dental managed care and preserve the solo practice model. A state dental association president explained that in his view “the ban on corporate practice is because of quality of care. (Corporate practices) are mega-practices that operate faceless practices that aren’t patient-oriented. (There is a lack of trust between dentist and patient so) patients don’t know if care is really needed.” This provision also erects a legal barrier to the development of public health dental clinics or the addition of dental components to community health centers unless exceptions are written into law or regulations. State B experienced this problem and had to get an amendment in the law during the 1999 legislative session to allow them to hire rather than contract with dentists. One health center official said “dentists don’t want to care for poor people but they don’t want us to either.” State A also has a ban on the corporate practice of dentistry and allows exceptions only for unlicensed or foreign dentists, who can be employed by public health clinics or nonprofits to provide indigent care under the supervision of a licensed State A dentist.

Simmering Resentments Toward Dentists and Organized Dentistry

One consistent finding was that there is a steady undercurrent of negative feelings about dentists among many of the people interviewed such as employers, purchasers of dental services, policy makers, state officials, community program directors, educators and regulators. This is important to describe so it can be factored into potential solutions. People in each state made some potentially offensive and controversial comments about typical personality types of dentists: they are difficult to work with, extremely independent, resistant to change, and don’t partner well with other professionals. Some of the same personal characteristics that make dentists capable of performing high-risk tasks that require extreme precision with little or no room for error may be what makes them difficult. In State A, one state official said: “Dentists are perfectionists, anal retentive. They are very high maintenance. Dentists are never really happy.” In State D another state official said: “They’re not willing to negotiate. I’m not as frustrated with them now, but I still think they could give a little bit more.”

Few people understand the economics of dental practice that give rise to many of these complaints. Some people express resentment that dentists behave more like business owners than health care providers and should have more concern about needy individuals and the health of the public. There are legislators and state officials who view dentists as uncooperative, greedy and lacking in empathy. A State E official said, “Once a dentist has established a practice, they feel no obligation to the community.” While there were differences between comments about organized dentistry and individual dentists, there were negative feelings and experiences expressed about both by a broad range of people interviewed.

Not Enough Clinics

In each state visited, people spoke of an inadequate public health infrastructure or safety net for dental care. The few community health centers that have dental clinics and the publicly or privately funded dental clinics are overwhelmed. According to the State C community health association, the pent-up demand is such that “whenever they open a dental site, the waiting list explodes” at all dental clinics in the state, after media report on low-cost dental services. However, State E’s Medicaid director also cautions that support for safety net dental services should not “let dentists off the hook” for providing care. He sees the safety net as a backup rather than a primary source of care. In State A, the dental director estimated that maybe 3% of the dental care in the state is provided with public funding through their 67 county
health departments. The rest comes from private dentists. State E has only one community health center and it can't keep up with demand for dental care. In the absence of sufficient public clinics, many people without insurance or a usual source of care go to the emergency room. A foundation-supported project in one part of State E found 800-900 emergency room visits each year for dental problems; 47% of those were for Medicaid-eligible patients.

Part of the problem is the extreme difficulty in recruiting dentists to work in safety net settings. The State C community health association says they currently have 15 openings for dentists at their clinics and two clinics staffed only by hygienists. Hygienists are not sufficient because “in community health centers, 20% is preventive and 80% is restorative. New patients are often a heavy investment in time and resources.” The dentists and hygienists who staff those clinics are personally and professionally challenged and need networking and support because of the high, unrelenting demands of the workload and the difficulties in caring for the population. Clinicians say that their patients have a high level of need and sometimes don’t follow up or complete their care, leading to a lot of frustration and worry among their caregivers.

Other Dental Providers
In some states and in areas within states, there is a shortage of hygienists, dental assistants and dental lab technicians, although this comment cropped up less frequently than the similar comment about dentists. Since most dental hygienists don’t work full-time, it is harder to interpret the numbers on supply. In at least one state, a university official said, “organized hygienists are the same as dentists in not acknowledging there is a shortage.” Another factor that was not often discussed is that it’s difficult to get dental hygienists to volunteer. Most hygienists are women who balance work and family obligations.

In State C, a community health center official bemoans the fact that opportunities for screening are being missed and wants to reach out to non-dentists. She noted that “pediatricians see children up to 15 times before age 3” and could provide dental screening. Whereas, “in our state, we have only 65 pediatric dentists and even they don’t want to see children before 3 years.”

Opportunities for Intervention: Supply, Distribution and Practice Patterns of Dentists
- To increase the number of providers willing to serve Medicaid patients, state and local officials all expressed a need for help in expanding the safety net for oral health services and recruiting full-time public health dentists.
- There is a need for funding to purchase equipment for offices or for outfitting mobile vans; one state suggested that matching funds be made available for this purpose. In State E, the Medicaid director wants funds to provide no-interest or low-interest loans to cover the capital costs of expansions for public health dental sites. State B community health centers need funds for capital expansions in underserved areas, but an even greater need is for funds to operate new clinics until they can become self-sustaining.
- There were also a few requests for assistance in expanding school-based dental services for children.
- One person requested placing a dental chair in a public hospital if another setting is not available.
- It is clear that dentists prefer treating low-income patients in a setting other than their offices. For services outside the clinic or hospital setting, some communities, particularly in State D, want help in coordinating volunteer dentists to see low-income patients. There is also need for dentists to supervise hygienists (at whatever level is required by the state) who volunteer to provide screening and hygiene services in schools and other sites in low-income areas.
- In a comment related to dentists’ attitudes, an administrator of the State C dental board said “a class by Ms. Manasse” would be very useful for dentists.
- Only one person, an insurance company foundation executive, expressed the desire to have funds.
to investigate training of a new type of mid-level dental provider, similar to a nurse practitioner or a physician assistant.

- The State C community health association wants help developing a program to train pediatricians to do screening for oral health problems in the 0 to 3 population and work with dentists to solve them. Similarly, an official at the dental school at a public university in State B wants funds to provide training for physicians, nurse practitioners and physician assistants in oral health screenings and application of fluoride varnishes.

- An advocate in State A suggested that a “medical home” model similar to the one the American Academy of Pediatrics developed for children would be helpful to link children and families with a dentist or clinic and to link together medical and dental care.

- Two dental schools expressed a desire for looser licensing requirements to allow foreign-trained dentists to pass exams and establish a practice or teach.
II. Federal and State Policy and Programmatic Issues

Barriers: Federal and State Policy and Programmatic Issues

Federal Policy Barriers

A number of people, particularly state officials, pointed to obstacles to access created by the federal design of Medicaid and SCHIP. For example, the optional nature of adult dental services in Medicaid and children's dental services in SCHIP undercut the importance of dental care and makes it among the first targets for Medicaid or SCHIP cutbacks. Also, since SCHIP is not an entitlement, benefits can be capped. Low dollar caps ($500 in State C and $300 in State B) mean children with severe oral health needs don't have “meaningful” coverage and need to pay high out-of-pocket costs for care, seek a source of charity care or go without care over the cap. The federal law prohibiting enrolling children with health insurance in SCHIP has created access problems for children with health insurance but no dental coverage. State D expressed interest in creating a dental-only wrap-around plan for these kids if the law was changed to permit it. Also, many low-income people who need care but are unable to pay for it are not eligible for Medicaid. Safety net providers—already stretched treating Medicaid patients—treat these patients without reimbursement.

Another problem relating to federal law mentioned by several states is that the Federal Tort Claims Act—which protects most employees in community health centers from malpractice claims—does not extend to dentists. Some states have all but discarded certain options to increase the number of providers, such as employing volunteer or retired dentists in a clinic, because of the prohibitive cost of providing malpractice insurance for them.

Reimbursement Rates

Certain state policies adversely affect dentists' willingness to serve low-income populations (Medicaid, SCHIP, and uninsured). Dental associations in every state claimed that reimbursement is too low, although at least one dental association president noted that reimbursement has improved in the last several years, and States B and C raised reimbursement rates during the last legislative session. For the most part, the dental association message hits home with legislators and staff. A senator in State E remarked that “most procedures pay below cost.” While this is true for the adult population, rates for children are actually in the 80-90th percentile—certainly not below cost—and Medicaid rates in some parts of the state are above private-pay rates. The State C dental association went so far as to say that inadequate rates result in “MASH dentistry” and a “double standard of care” with some profiteering dentists setting up Medicaid-only clinics and performing “factory dentistry.” The representative went on to add that the “crisis in access would go away if dentists were paid at the 75th percentile.” Some people suggested that the methods states use to calculate reimbursement are outdated and inadequate. (To this end, the Milbank Memorial Fund has developed an alternative reimbursement model using interactive actuarial software.)

Barriers to access also result when some procedures or services receive no reimbursement. For example, coordination between physicians and dentists is rarely funded, though some see the need for it. State C's SCHIP director believes that “whenever kids interact with the health care system, primary care providers should refer or link them to needed oral health services. Any case management or follow-up should include oral health.” However, this type of coordination is rarely funded. Also, states rarely provide extra reimbursement for the elderly or people with disabilities, as State E does, though it is more difficult and time-consuming to treat these patients than to treat children.

Administrative Barriers and Patient Compliance

Other factors that make dentists unwilling to serve low-income patients are continuing administrative hassles, although some states have instituted electronic billing, begun using ADA billing codes and claim forms, and reduced or eliminated prior authorization requirements. State E's dental association remarked that the time required to receive payment has doubled to 6-9 weeks in 2002 for an unknown reason.
Failure to keep appointments is another factor that limits dentists' willingness to serve low-income patients. State officials agree with dentists that no-shows are problematic but have made little headway in addressing the problem. There are long waiting lists in both public and private care settings.

Limited Public Employee Benefits
Many feel that oral health is systematically undervalued. The low valuation of dental care is also reflected in the uneven benefit packages for state employees: dental benefits are not subsidized for State E’s employees and dependents or most State A workers. If benefits are offered, the reimbursement levels are often low. Roughly 60% of full-time public employees have dental insurance, but the services covered, copayments, deductibles and dollar caps vary.

Fluoridation
Although each state we visited has some funds for them, programs to fluoridate water systems are generally small and on the defensive. During the last legislative session, State B cut its fluoridation budget by 80% to help offset a small part of the cost of the Medicaid reimbursement rate increase. The state dental director said the current state health commissioner does not believe fluoride is beneficial and has fears about its safety. Also in State B, one of the largest cities in the country without fluoride voted a few years ago to fluoridate after years of contentious debate and an enormous community coalition effort but has yet to implement it. In State D, legislative leaders had been working at the local and state levels to get communities funds to fluoridate water, but county boards voted it down for several years. A grassroots effort in State D won a referendum approving fluoridation in three cities last year, although implementing it has been stalled by court challenges and efforts among some smaller communities to opt out of the water system.

Scope of Practice and Supervision Battles
Persistent opposition by state dental associations to the attempts by dental hygienists to expand their scope of practice and loosen supervision requirements was mentioned in every state we visited. One community health center official said: “Dentists are the most territorial mammals on the face of the earth, except maybe dogs.” This struggle is similar to others between professionals, such as physicians and nursing groups. These are very difficult issues for legislatures because they pit important groups against each other, involve complex technical issues unique to each profession and have the potential to hurt or help the public. Hygienists are trained to provide various preventive and “triage” services but are often prevented from doing so under state practice acts. Hygienists feel they can remedy access problems by going directly to underserved populations (thus removing transportation and outreach barriers and solving the no-show problem). In their own defense, dental associations disagree that changes in scope of practice or supervision are needed to improve access, arguing that most low-income patients need restorative care which can only be performed by a dentist.

In the states we visited, organized dentistry has consistently opposed hygienists’ attempts to practice to the full extent of their training under any level of supervision and opposed attempts to perform services off-site that they can do under a dentist’s supervision. There seem to be big disparities in practice acts governing hygienists and assistants between and within states. In State A, hygienists need direct supervision to apply sealants, while in other states, sealants can be applied by dental assistants. In State E, hygienists can perform a full range of services on reservations, but not in private dental offices a few miles away. In State C, hygienists can get their own Medicaid provider numbers and set up independent practices. However, the dental practice act in State C will be reauthorized next year and most people expect that independent practice and the ability to get separate Medicaid provider numbers will be challenged by the dental association.

There were several comments from hygienists, advocates and educators about the suspected presence of sexism and a “good ol’ boys network,” in keeping dental hygienists from expanding their scope of practice.
or practicing more independently, since the great majority of dentists are men and hygienists are mostly women. A dental educator in State B said the newly enacted program that will allow dentists to provide clinical training to prospective hygienists is “a slap in the face of the hygiene profession and to women.” There are also differences in practice between dentists and hygienists that deteriorate their working relationship and reduce mutual respect. For example, dentists believe in applying sealants only to healthy teeth, while hygienists in two states said they have been taught that sealing a decayed tooth prevents further decay and still allows a dentist to restore it.

State Fiscal Woes
All of these factors are overlaid by the fact that states are facing budget crises. New state-only initiatives regarding dental health—which many policymakers fail to recognize as an important health concern—are unlikely to be funded. The goal of most state officials is simply preservation of programs, rather than expansion. (In fact, since the beginning of this project eight states have cut back on or eliminated adult dental benefits in Medicaid and four more considered doing so.) Hiring freezes in at least two states we visited (States A and E) mean that open oral health positions cannot be filled. In the case of State E, the hiring freeze has blocked state agency officials from hiring a needed data analyst to complete an evaluation of a case management program, despite CDC funding for the position. (They will attempt to contract with someone for the life of the CDC grant to circumvent the freeze.)

Opportunities for Intervention: Federal and State Policy Issues

- A number of states said they needed funds to make existing programs, such as Medicaid or SCHIP, work better. State funds to maintain oral health program staff are insufficient. State agencies said they needed funds to increase reimbursement rates under Medicaid and SCHIP because revenues are too scarce and, in some cases, rates are so low that increases to a realistic level are simply unaffordable. Another state suggested that funds to provide incentives for dentists who treat disabled and low-income, high-need patients would be helpful. State A's dental association wants a small grant to conduct outreach to dentists to become Medicaid providers. An advocate for special needs kids in State A wants the state to establish a referral hotline that would provide information about which dentists are accepting new Medicaid patients.

- Fluoridation was a topic on many wish lists. Several states said they needed funds to expand fluoridation, specifically to buy equipment for communities to use to fluoridate their water supplies.

- There were a few ideas and requests for assistance to change the current financing or delivery system or experiment with new practice models. The State B dental director wants help establishing a non-entitlement dental care program for adults. Another state wanted seed money to establish or support “model practices” and demonstration programs to improve access. One state requested support for development of a dental HMO that uses evidence-based practices, focuses on prevention and evaluates outcomes.

- Finally, across the board, dental hygienists requested help in working to loosen supervision and expand scope of practice to the extent of their training so they can help improve access to care for low-income people.
III. Dental Education

Barriers: Dental Education
Other than Public Health Service Act provisions and the National Health Service Corps, which both offer limited support for dental professionals, there is little federal support for dental education. Federal support ended in the late 1970s in response to concerns about a potential glut of dentists and some reported difficulties by new dentists seeking to establish a practice. Other than general support for public universities with dental schools, state support is limited to loan repayment or scholarship plans. Though such programs exist in statute, they may be poorly funded by states and limited in number. For example, there are only five slots in State B. The State E legislature specified population ranges for each of the three loan repayment slots created in 2000; only the slot in the most populous area has been filled.

Eighteen states (soon to be 16 with new schools in two states) have no dental school. States that solve that dilemma through cooperative arrangements such as WICHE have increased opportunities for their students to receive a dental education, but have no guarantees that they will return to their home state. A shrinking number of dental school applicants are competing for a shrinking number of dental school slots. Even if a school acknowledges a shortage of dentists and wish to increase the number of graduates, expansions in class size are limited by a shortage of dental school professors. Dental schools have trouble recruiting faculty because salaries are much lower than a dentist can make in private practice. Furthermore, some people, such as the dean of a dental school in State C, believe the lack of diversity in the dental profession is detrimental to care of the underserved. According to a state official in State E, young dentists view their profession “as a business, not healthcare.” Other people raised questions about the lessons students learn in dental school; one state official heard anecdotally from students that their dental school blatantly advised them not to treat Medicaid patients.

Opportunities for Intervention: Dental Education
In states with a dental school.
- Non-profit providers need funds to hire dentists to provide supervision for dental graduates and dental students who are doing residencies and externships in sites that provide care to underserved patients.
- A related request was for changing dental education so that rotations through community clinics are a condition of graduation.
- Several state officials also wanted funds to promote the dental profession to high schools students, recruit dentists to the state (particularly to rural and underserved locations) and recruit “a different type of student” into dentistry (particularly nontraditional students, minorities, women and people interested in public service).

In states without a dental school.
- States without a dental school have different needs than states with dental schools. For example, State E needs funds to provide placements for second and third year dental students. (They don't have the clinic infrastructure to house visiting dental students or the funds to pay someone to supervise them.)
- States without a dental school need help developing a satellite school with a neighboring state's dental school.
- These states also want help in designing incentives to ensure that state residents return to the state after attending dental school elsewhere.
IV. Research Issues

Barriers: Research Issues
In every state, people expressed the need for more information to help them do their jobs or move the policy process forward. There were two general types of requests: one for more data on the nature and extent of current access problems and the second for research, evaluation or policy analyses on financing or program models to fix access problems. State A’s Medicaid director said they “need information to support state efforts to invest in dental services. It is very difficult to generate support for dental services in this state.” One legislative staffer said he needed much more information about the exact nature of the access problem, asking, “how much is due to factors specific to low-income people and how much is due to the Medicaid system?”

A number of states want more current and detailed information about the prevalence of oral health problems and unmet need among different populations, not only to spur policy and program development but to develop realistic cost projections of new dental benefits in Medicaid and SCHIP. State A is piecing together small amounts of money from several sources to do a surveillance project on Head Start students, 3rd and 9th graders. The State C SCHIP director wants to know what true need is for dental services among children in the SCHIP program (between 133% and 185% of the FPL) once previous pent-up demand has been satisfied so accurate cost projections can be made. The State B dental director wants to collect and analyze data on what happens to children who need more care than the SCHIP benefits provide (over the $300 therapeutic cap), partly to spur changes in benefit design and partly to better assess the true costs of a comprehensive benefit.

A few states have studied, or wish to study, how much Medicaid spends on emergency care for dental pain and avoidable oral health problems that could be treated by a dentist. A related question was posed about the cost of hospital dental care for disabled patients for care that could be delivered in a dental office if qualified dentists were available. Another fact not available for states or localities is the number of school days missed by children due to oral health problems; this is seen to be key to spurring investment in oral health programs for children. A disability advocate in State B wants information about the impact of untreated dental problems and poor oral health on employability.

The questions on financing and program design either involve how to make the current system work better or ways to experiment with different models. A nagging question involves the need for research documenting the impact of raising reimbursement rates. According to the State A Medicaid staff, “legislative staff in State A believe that reimbursement rate increases are a waste of money because they don’t increase dentists’ participation.” The State C Medicaid agency wants a detailed study to compare Medicaid and SCHIP oral health programs across states with respect to codes, reimbursement rates and administrative processes to help them better manage the program. Their second question involves how much of the capitated rate for dental should be spent on education of clients and their families about good oral health practices.

One person said, “new thinking is needed about how to get dentists to see low-income patients. Should it be a daily rate to see patients one day a week or one day a month?” Another asked, “what works to reach the low-income population who mostly don’t get information through reading?” State E was in the midst of evaluating a case management program when the program director left her job and the project was left uncompleted. State A Medicaid would also like to test a prepaid dental plan for Medicaid beneficiaries on a voluntary basis in one county.
Opportunities for Intervention: Research Issues

- In every state, someone asked for state-specific data about unmet oral health needs in specific populations, including surveillance data for children at specific grade levels.
- Advocates, legislators, and legislative staff need policy analyses to review data in the context of specific interventions and explore the costs and benefits of each.
- Many states want funds for demonstration or pilot projects to help states show what works to fix system problems and funds to produce objective evaluations to document lessons learned.
- Descriptions of best practices and dissemination of information about successful programs are lacking and very much needed, as well as funds to replicate successful programs once they are identified.
- Sharing information that now exists—such as program evaluations of state programs or national data sets—is important but is not being done. Information to move policy forward has not been made available or is not known to most people working on these issues at the state level.
V. Leadership

Barriers: Leadership
A problem consistently mentioned across states is the low level of education, awareness and interest among legislators about oral health issues. Advocacy groups expressed a need to have legislative champions in each chamber of their legislature. In the states visited, State B is losing both of its champions this year to redistricting, State D is losing one of its two champions to retirement, and State A has no champions on health issues at all, let alone on dental. At least one legislator in State E considers herself a champion of dental health, but with a legislature that meets for only 80 days every two years, she finds it difficult to devote too much energy to one of many pressing issues. In State C, a legislative leader pushed to allow independent practice dental hygienists to bill Medicaid; that leader is now the governor, thwarting the hopes of the dental association to repeal that law. However, there doesn't appear to be a current legislative champion in State C. While advocates see legislative awareness and leadership as crucial, not all legislators agree they need much education. One legislator suggested that broad education efforts shouldn't be more elaborate than bullet-point notes on a single page. Since State E's legislative session is so short, her colleagues rely heavily on the relevant committee's assessment of a bill; therefore, she doesn't think broad education efforts in the legislature need "glossy paper" presentations.

Education about the differences in the economics of dental versus medical practices is clearly needed to lend a rational underpinning to debates about raising Medicaid and SCHIP reimbursement rates. In the absence of more education on these issues, there are common misperceptions among legislators that give rise to sentiments such as "dentists are rich people who don't need more money in reimbursement rates." One State D senator allegedly asked at a hearing: "Did you know dentists make more than physicians?" Education about the importance of oral health, the need among specific populations, and gaps in services are also important.

Another related issue is the need for educating legislative staff about oral health issues. They are the "detail" people who work on bill drafting, cost estimates, program analysis, committee hearings, and executive branch oversight. Staff are particularly important in the 11 states where term limits have taken effect (there are 6 more where they have been enacted but not implemented yet), and other states with high political turnover because they supply the institutional memory lacking in the new crop of legislators. The level of awareness and knowledge in the legislative staff interviewed for this project was spotty.

In addition to leadership in the legislature, a number of people said it is important to have a full-time dental director in each state department to provide leadership on oral health issues. In California, Maryland, Nevada, Rhode Island, West Virginia and Wyoming, there is a part-time dental director. In 41 states there is a full-time dental director. Currently, Washington, Oregon and Michigan have vacant dental director positions. The dental director is generally the advocate within state government, sometimes in conjunction with a dental analyst or director within the Medicaid agency, for funding for oral health programs. They make budget requests and other recommendations to health commissioners and Medicaid directors, who in turn make recommendations to health and human service secretaries and to governors.

Many public officials and dental professionals remarked that consumers and policymakers do not understand that oral health is a part of overall health. As a result, oral health seems to be a low priority for some state health agency officials. Without consistent strong leadership within health departments and Medicaid agencies it is difficult to get support for oral health programs. Dental directors in States A, B, and D said they did not get support from the health commissioner or governor in asking the legislature for funding for health programs. Strong leadership may have a cost, however. The State B dental director told us that his two predecessors had been fired for being too "activist" and that he had not been consulted by
the Department of Human Services (which runs Medicaid and SCHIP) about the planning or implementation of the dental benefit. Since oral health is a small percentage of overall spending in Medicaid and public health, it doesn't garner much attention in the policymaking or budgeting processes.

**Opportunities for Intervention: Leadership**

- Throughout the visits, people spoke of the need to develop leaders among legislators. In each state, people said they needed education for legislators and legislative staff to elevate the issue of access to oral health care on the priority list and convince them of the need for investment in oral health programs. There was a particular sense of urgency for this task in states that were losing their leaders to redistricting or retirement. Special attention should be given to members and chairs of health committees since these legislators may have more power to move the debate and influence other members on health issues.
- Some states want funds to hire oral health staff due to state budget shortfalls and hiring freezes.
VI. Advocacy

Barriers: Advocacy
Lack of A Powerful Voice
A consistent theme in states is the lack of effective advocacy for oral health issues in general, and access to dental care for low-income people in particular. The State D legislative staff director for the appropriations committee said “there is no constituency for it. Because of the limited time legislators have during a session to consider specific populations or services, the burden to push an issue is on the advocacy groups.”

State E expressed the need for a coalition or a “powerful voice” to speak out on behalf of oral health. State D, while it has a coalition, says “we are flying by the seat of our pants here,” and they lack knowledge about how to operate it and funds to staff it. In State E, the maternal and child health director said the state lacks “funds for coalition-building.” The State A health commissioner claims “the state needs funds for a staff person to support the coalition.” State A has a coalition that grew out of its work with the NGA policy academy, but it lacks broad representation and political clout. State B has no oral health coalition. The maternal and child health coalition in State B does not lobby on oral health although it did work to get dental benefits included in SCHIP. The director of the coalition said, “oral health needs to get on the list of needs and become a priority.” State C also lacks a coalition, although advocates did organize for a one-time push to add dental coverage to SCHIP.

Advocacy groups clearly need more and better information to be successful. An advocate in State A said, “there is no objective material available that we can use for advocacy on dental and we have no time to develop it.” In States A and D, advocates pointed to campaigns on issues that were coordinated by a national office that could supply materials and data to state groups that can be tailored to their needs. They said there is nothing like it for dental access. A reporter for a local newspaper in State A pointed out that the advocacy groups that lobby for services for children and the elderly are different, and that “between older people and kids, kids rarely win. Children’s issues are a low priority compared to senior citizens.”

Oral health is also not a priority for advocacy groups in the disability or special needs kids communities. In States A and B, the disability community says that oral health is a “back burner issue” because access to health care can be a life or death issue.

Dental Associations are Not the Best Advocates for Low-Income Programs
In all the states we visited, the only or most visible group lobbying the state legislature is the state dental association. Organized dentistry is extremely powerful at the state level, second in influence perhaps only to physicians, and is seen as the main group that determines policy outcomes on oral health programs. In State A, a senior legislative staffer stated, without any awareness that her statement was controversial, that “my chairman won’t support anything the dental association opposes.” Dental associations are poor advocates for access to dental services for Medicaid and SCHIP beneficiaries because they are perceived as self-serving in seeking increased reimbursement rates. They are sometimes perceived as providing false leadership or “lip service” to access issues for low-income people.

Hygienists are Relatively Politically Inactive
On the contrary, according to the state officials we visited, dental hygiene associations are not powerful. Hygienists are less likely than dentists to belong to and be active in their state associations. This lessens the funding available for lobbying on their issues and lessens their clout. Their solutions to problems are not brought before the legislature as often, considered as carefully, and given the same weight as those brought by the dentists. Besides dental associations and dental hygienist associations, community health centers...
were mentioned as meeting with legislatures occasionally on oral health issues, primarily to request funding for services.

Decisions are Made Out of the Public Eye
An important issue related to advocacy is that many decisions affecting oral health programs are made in isolation; there seems to be no consensus-building function within the states we visited. Information about the problem at hand (potential budget cuts, workforce shortages, etc.) is not shared, and decisions about how to solve them are made with no broad discussion involving different sectors of the policy community. For example, State D recently cut its dental benefits in SCHIP because of state budget shortfalls. Although there were unspent federal SCHIP funds, the state did not have the funds needed to match them. The decision to cut dental benefits, rather than cut other benefits or reduce costs in some other way, was made by the SCHIP director without consulting the legislature, dental association or advocacy groups. Similarly, legislative leaders made the decision to cut adult dental benefits in Medicaid in State D without consulting the health committee, the health department or advocacy groups.

The relative weakness of advocacy groups allows these important decisions to be kept out of the public eye. They seem ineffective at “spreading the word” to their members and the general public about a pending decision so they can attempt to influence it.

Opportunities for Intervention: Advocacy
- Advocates universally claimed they needed information and objective data on oral health problems in their state and an evaluation of policies tried by other states. Other people echoed the need for assistance in translating data and information into a form that motivates people to act.
- Advocacy groups also said they need financial support.
- Another theme was the need for support to develop coalitions, staff them and help them be effective in reaching their goals. A closer working relationship between the legislature, executive branch agencies, program level administrators, providers and advocacy groups can ensure an exchange of information and a discussion about the potential impact of a pending policy change, even if consensus is not possible.
VII. Public Education

Barriers: Public Education
The need for educating the public about the importance of oral health and its relationship to overall health was mentioned frequently by a wide variety of people. An advocate in State B said “lack of access to oral health services is not considered a health care crisis.” Low-income people and immigrants in particular were singled out as in need of education because they don’t practice preventive measures sufficiently and only seem to come in for care when they experience pain. Some low-income immigrants and certain cultural groups also feel that losing teeth is a normal part of aging. A legislative staffer to the appropriations committee in State D said, “lack of demand for oral health services is a barrier. If more people wanted the services, they would be willing to pay more taxes to make sure they get them.” Older people with dentures don’t realize they still need care and screening for oral cancer. The lack of education and awareness about what constitutes quality oral health care is pervasive.

Compounding this issue is a host of barriers to enlisting the media in the effort to educate the public. Electronic media rarely cover issues in oral health policy because they are too long and complicated to explain in the short segments reserved for news stories and aren’t considered interesting enough for longer features. Print media reporters said that health policy issues in general are considered by editors to bore readers. Reporters interviewed said they can only write about health policy issues if they get a local angle to the story, such as a local clinic adding or losing a dental component, or if they can cover them as part of a story about state or local government. Occasionally, reports issued by national groups can be covered if they shed light on the state’s performance on an issue or problem. A reporter in State D said he needs help finding “success stories and personal examples” in order to provide a local hook and make the story newsworthy or appropriate for a feature story. A State A reporter said “I need more national reports with state-by-state data so I can run state-specific articles; local information would also be helpful.” With regards to educating the public about the importance of oral health care and the number of low-income people who can’t get care, one reporter said, “unmet need is not newsworthy.”

Opportunities for Intervention: Public Education

- People from all sides of this issue requested financial and operational support to educate the general public about the importance of oral health, particularly about disease prevention, fluoridation and the links between poor oral health and low birthweight babies, pre-term births, and cardiovascular disease. One coalition executive called for “a big public relations and awareness campaign similar to Watch Your Mouth targeted to legislators and the public.”
- The State A disability community suggested that families needed education about what constitutes quality oral health care.
- Other suggestions or requests were to educate specific patient groups seen as key to improving access to oral health care or patient behavior. A foundation in State C feels that the group most important to educate are parents and grandparents of low-income children. State E requested help in providing oral health information to low-income mothers through their home-visiting program. State officials also called for support to educate the Medicaid population about how and when to seek care and how to prevent oral health problems.
- Finally, there were a number of requests to support education for health care reporters, primarily print media. Both reporters interviewed said they needed help building their knowledge base about oral health and the programs that are used to solve problems. Invitations to conferences on health policy issues were suggested as a good method to provide education. Reporters can’t accept gifts, but waiving registration fees for conferences was one suggestion as a way to promote attendance.
VIII. What Didn’t Surface on Wish Lists

Long on Barriers, Short on Solutions

One of the interesting things about the many interviews conducted as part of this study is the lack of a one-to-one relationship between barriers identified and requests for assistance or ideas for foundation investment. Frequently, people identified barriers but requested assistance to do something other than address those barriers. This may be because it is always easier to identify problems than to solve them. Also, some people interviewed had no idea how foundations work in terms of funding constraints or grantmaking goals; they had few or inappropriate ideas about how foundation support might help (for example, suggesting foundation funds could be used to pay for services or increased reimbursement rates). Other interviewees were simply giving “wish lists” without regard to a foundation’s potential role or the financial or political barriers in achieving the change. However, it is very clear that most people are very rooted in the present. They acknowledge the power of the state and national dental associations and the current structure of dental care financing and service delivery in this country and have trouble looking beyond these institutions.

Some Important Omissions

Given the fact that people assume the status quo will prevail, it is not surprising that almost no one suggested foundation support to increase the supply of dentists even though many people feel there is a shortage in their states. Also, only one person suggested trying to develop a new mid-level practitioner such as nurse practitioner or physician’s assistant which could extend the capacity of the existing dental workforce and help improve access in rural areas. This may be because of the difficulty dental hygienists have in expanding their scope of practice and loosening supervision; if an established profession has made no inroads, how could another a new type of professional hope to deliver any of the services dentists now provide? It was interesting that no one suggested researching and writing a report about or working to reduce the wide variations in scope of practice and supervision requirements for dental hygienists and dental assistants. For that matter, although the ban on the corporate practice of dentistry was mentioned as a barrier in several states, no one suggested doing a study on how many states have such a ban, what the impact has been and how states have fared without it. Another request notable by its absence is support for advocacy efforts surrounding water fluoridation. Many people asked for funds to provide equipment for fluoridation, but none for information or advocacy, although it could help make difference in these local decisions. No one requested a paper or other education effort explaining the differences between dental and medical practice, or “dental economics,” to policymakers but it is clearly needed. Most people don’t know or appreciate why dentists refuse to see patients for whom reimbursements are below cost. No one suggested education on oral health for governors or their health policy staffs to increase their support and involvement. Finally, no one suggested leadership development among dentists or dental associations even though many leaders on low-income access issues in states come from that community.
IX. Conclusion

Three Components for Policy Change

A well-known book, John Kingdon’s Agendas, Alternatives and Public Policy, puts forward a simple framework for analyzing the components needed for policy change. He says that three things have to be present in order to move an issue forward. First, there must be a commonly accepted definition of the problem. Second, there must be a workable policy solution to the problem as it is defined. Third, there must be political support for the solution among all the relevant parties required to enact it. These three things must occur together in proportion to one another for policy change to take place. A huge problem coupled with a small solution without political support from all important actors will not work. A well-defined problem with an unpalatable solution will not get the political support to work. There are many examples of this framework from the site visits that explain why the states visited have not moved forward forcefully to solve problems and point to interventions that might break the logjams.

Defining the Problem

In the states NCSL visited, there was not a commonly accepted definition of the problem causing access difficulties. In particular, there is strong disagreement about whether there is a shortage of dentists or just a maldistribution and too few who are willing to see publicly insured patients and people with disabilities. There is also disagreement about how to define problems of access within Medicaid. Is it a problem of poor oral hygiene, cultural beliefs and compliance among patients? Do patients not want dental care? Is it a problem of low participation in Medicaid among dentists due to reimbursement rates and administrative hassles? Or are dental practices already at capacity and therefore acting as any business should to optimize profits by not substituting low paying patients for those who pay cash in full? Assuming that access problems are multi-dimensional and complex, there is little consensus among people working from different perspectives in states about which specific policies need to be changed—let alone what those changes should look like. The process of defining the problem is not simply one of obtaining information to answer a question, but of perception and momentum behind an issue generated by people working on it from all sectors.

Data that might be used to arrive at a common definition of the problem is either not available at all, not shared for political reasons or not understood by people who are in a position to make decisions. State agencies that might have useful data don’t have the funds or staff to retrieve it or have not been asked for it. Dental associations view some data and information as proprietary and potentially harmful to their interests. In State B, the dental association is willing to support some new slots “if valid scientific evidence showed a shortage” but this evidence is unlikely to be available to a state agency, the legislature, or advocacy groups without dental association cooperation in obtaining it. One state dental director said he would have to file a Freedom of Information Request in his own state to get SCHIP utilization data, although he has Medicaid data and both programs are in his department. In State A, the state board of dental examiners claimed they didn’t have personnel with the time or skill to retrieve information on the age of the dental care workforce from individual dental licenses, but they said the dental association had the information. The dental association said they don’t have it but the health department does. The health department says they don’t have it either. Therefore, the governor and legislature do not know that a large percentage of the dental workforce may retire in the next decade, without sufficient numbers of new dentists being trained to replace them.

The media—who often generate interest in an issue, broaden awareness of a problem and help shape the definition of the problem in its coverage—are largely silent on access to oral health care. For the most part, the public isn’t hearing about these issues on television, radio or in newspapers and pressing policy makers for action. Television covers shorter stories and local print media rarely cover health policy issues, particu-
larly issues without a local angle. Political leaders aren't convening hearings or public forums to discuss access to oral health care because these problems aren’t “on the radar screen.”

In order to move the policy process forward, RWJF support could:

- Fund **consensus-building** activities in states such as oral health policy academies, task forces and commissions and provide ongoing technical assistance to ensure lasting results.
- Be used to **educate the media** and work with editorial boards on oral health issues.
- Help **educate both the general public and high-risk groups** such as immigrants, Medicaid and SCHIP recipients and low-income mothers and grandparents about prevention, the importance of oral health to overall well-being, and how to use services.

**Formulating a Policy Solution**

In the states we visited, there was no agreement about workable policy solutions, putting aside the lack of consensus about how to define the problem. For example, if a state has decided that its access problems are due to workforce shortages, there are a variety of potential policy solutions. One obvious solution might be to expand the number of dentists being trained in the state's dental schools, or, for states without a dental school, to buy slots in a neighboring state's school or establish a residency program to bring third-year students or graduates to the state. With the exception of State E's dental association, every state dental association we visited had already opposed that solution in recent years, saying the state had an adequate number of dentists and an increased supply would threaten the practices of currently licensed dentists. And, in an exercise of dental association power, a satellite residency program in State B that was passed and funded by the legislature over dentist opposition died in implementation. As a professor at the dental school said “we attempted to establish dental residences but the local dental societies ran us off.”

Even if there is general agreement about expanding the workforce through dental education, a host of additional problems arise. How should the state address a shrinking number of applicants for dental schools? Lack of diversity and a public service orientation among prospective dental students? Reduced state funding available for dental schools? The dental faculty shortage? A shortage of classrooms and dental chairs for teaching? In State E, there aren't enough state funds to establish residency slots for third-year dental students, although most people agree there is a shortage of dentists. In State C, the dental school feels that dentists' income of more than $160,000 a year attracts a certain kind of student (one who is interested in high earnings) and leads to dental faculty shortages. Nationwide, there are more than 300 dental faculty vacancies, 70% in clinical training.

Another potential solution for the problem of workforce shortages is enlisting other providers to deliver services. Dental hygienists have been working consistently in states to expand their scope of practice and loosen supervision requirements but have met with opposition from the dental association, which argues that hygienists' training cannot address the restorative care needs of low-income patients. Of the states visited, only in State C can hygienists practice independently and bill Medicaid directly. In State A, which has very tight supervision requirements, a state oral health council was asked to consider independent practice for hygienists and they said “over my dead body because... dental practices will go bankrupt.” Objective analysts might look at the situation and see that dentists and hygienists each have training to improve access in two different but equally important ways, through restorative care and prevention, respectively. However, crafting a policy that reflects this has proven to be too tough to do in almost all states.

Another potential new source of care is pediatricians, pediatric nurse practitioners and other medical personnel who can be taught to screen for dental caries, apply topical fluoride, educate patients and parents about proper oral hygiene and make referrals to dentists for restorative care. In most states, dental practice acts define some of these services as the illegal practice of dentistry if performed by anyone other than a dentist licensed to practice in that state, punishable by fines and revocations of license. Potential
changes in the dental practice act are fraught with heated discussions about endangering the quality of care for patients. The dean of a dental school in State C has begun training ear, nose, and throat clinicians in the basics of oral health and wants to expand to other medical professionals, and in State B, a hygiene professor—quietly, to avoid being blocked by the dental association—is considering a similar effort.

Each of these potential methods for expanding the workforce has been attempted in a site visit state. However, because of the dearth of data collection and evaluation resources, the innovative state and others considering modeling the policy are left with two unanswerable questions: Did the policy work?, and Why or why not? Consequently, though facing similar problems and considering similar solutions, each state is needlessly working in a policy vacuum. In order the move the policy process forward, RWJF support could:

- Fund policy analyses, program evaluations, cost-benefit analyses, reports of best practices and surveys to gather policy relevant state and local data;
- Fund some policy work that would explore alternative practice and service delivery models, new providers, and “out of the box” thinking;
- Support a dissemination effort targeted at people in every part of the policy process is needed.

The Politics

Finally, in the states we visited, there was not broad political support for policy change in oral health. There are few groups working on oral health issues, and they do not speak with one voice. State dental associations are among the two or three most powerful groups in state politics and are generally the only people speaking with legislators and staff about oral health issues. There were overt statements made by people interviewed about their strong influence in state policy matters; in most states at most times, dental associations can stop any initiative they oppose. Organized dentistry is not seen as effective in lobbying for increased reimbursement rates because they appear self-serving rather than interested in access for low-income people. However, in the states we visited, dental associations had not been active in seeking many other remedies for access problems. Hygienists aren't terribly active politically and have a difficult time pursuing their agenda with state legislatures to the extent that it conflicts with the dentists. Community health centers lobby but for many health issues, not just dental care.

Most state-based health advocacy groups are not active on oral health issues, and if they work on it at all, it's a low priority. The natural allies among advocacy groups are maternal and child health, disability, and poverty and welfare groups, but none work on oral health in any sustained fashion. Also, the leaders among state executive branch agencies do not place oral health high on the priority list. Health commissioners and Medicaid directors have many important issues on their plates, and dental directors do not generally have the clout to raise the profile of their issues any higher. This reflects the generally lower priority that the public places on oral health compared to physical health.

Finally, there are few champions for oral health in legislatures. Most legislators are not educated about these issues and many states don't have any that are committed and willing to push policy initiatives forward. Some states with knowledgeable committed legislators are losing them to redistricting or term limits with no one to fill the void. Legislative staffs also need education. Health and appropriations committees cover a broad range of issues during hearings and access to Medicaid or oral health may receive only a few minutes. In states with a history of low taxes and an emphasis on personal responsibility rather than government assistance, it can take extraordinary intervention, such as a lawsuit filed against the state, to spur policy action.

In order the move the policy process forward, RWJF support could:

- Be extremely useful in supporting coalition building and advocacy efforts, both outside of government and including government;
- Assist in educating legislators and legislative staff, and developing legislative leadership on oral health issues.
Appendix I. Methodology

There were three sets of activities involved in this study: data gathering and analysis; conducting a meeting of national experts and a focus group of state officials and advocates; site visits to five states.

NCSL gathered and analyzed a wide variety of reports, peer reviewed articles and other information about state dental programs in Medicaid and SCHIP, and oral health improvement efforts in general. Prior to the beginning of this contract, NCSL filed a Freedom of Information Request with the Centers for Medicare and Medicaid Services to obtain copies of reports filed with CMS by states about access to dental services for children. NCSL also collected dozens of reports produced in the last five years by state departments, commissions, coalitions and task forces about oral health. These included materials submitted to NGA by states applying for the oral health policy academies. NCSL prepared summary sheets with two pages of data about each state program. The goal was to collect in one place basic information about dental education, hygiene education, the dental and hygiene workforce, children's services in Medicaid, reimbursement rates and administrative simplifications in Medicaid, regulatory issues and state program leadership and interventions.

In order to select states for site visits, NCSL reviewed state documents, collected data and compiled two page summary sheets on each state. The goal was to identify states that are not considered the front runners in oral health programming, nor are they considered the least active and promising as sites for investment of RWJF resources. The five states with the highest reimbursement rates and three more that are considered “best practices” states with respect to the priority placed on oral health and the development of their programming were eliminated from consideration. NCSL then identified 11 states that fit the “middle” criteria and presented details on seven that represented a range of states geographically and politically. Two states were eliminated from this list for being too advanced. This yielded five states selected for site visits.

Visits were arranged for 2 ½ days of interviews with as many people as possible who could offer important information about policy barriers and opportunities for intervention. The goal was to include key legislators and legislative staff that chair or staff health committees or health appropriations, or who are leaders on oral health issues; maternal and child health, disability and/or oral health advocates; the state dental board; the state dental association; the state hygiene association; local or state executives from foundations that support oral health programs; community health center or dental clinic representatives; SCHIP and Medicaid directors and dental officers; the state dental director from the health department; and faculty from dental and hygiene schools. It wasn’t possible to meet with every representative in each state given time restrictions and scheduling conflicts.
With Just Months To Go, New York State’s Health Benefit Exchange Gears Up For Open Enrollment

Harris Meyer

New York is a deep-blue state that Barack Obama won with 62 percent of the vote in both 2008 and 2012. Even so, the state’s Republican-controlled Senate balked twice at approving a central feature of President Obama’s signature health care reform law: a state health insurance exchange.

As a result, Democratic Gov. Andrew Cuomo had to issue an executive order in April 2012 to establish the New York Health Benefit Exchange. “Establishing the health exchange will bring true competition into the health care marketplace, driving down costs across the state,” Cuomo said in a written statement when he issued the order.1

The Affordable Care Act requires an exchange in every state. New York, Rhode Island, and Kentucky are the only states that have established their new federally approved health insurance market by executive order. Thirteen others, plus the District of Columbia, have done so through legislation; Utah is awaiting federal approval of its legislatively created exchange. The remaining thirty-three states declined to set up an exchange on their own; as a result, in those states the federal government will run an exchange by itself or in partnership with the state.

Governor Cuomo’s executive order came nearly a year after the New York legislature's failure to pass legislation. The delay has pushed the Empire State hard up against the deadlines for implementing the health insurance marketplace, which require starting enrollment on October 1, 2013, and coverage on January 1,
2014. Yet, unlike many other states that are struggling to meet the quickly approaching deadlines, New York has the support of nearly all stakeholders, including Republican Senate leaders, as it works to establish a state-run exchange. Since the executive order was issued, the state has by most accounts moved efficiently to get enrollment started on time.

“New York is doing the best job one can expect given all the challenges,” says New York Senate Health Committee chair Kemp Hannon (R-Nassau County), who in 2011 backed the bipartisan bill to create an exchange that didn’t pass. “I haven’t heard anyone griping,” he adds. “But we’re building something entirely new, and even Amazon had growing pains at the beginning.”

The law’s proponents say it’s crucial for pro-reform states like New York, California, Maryland, and Oregon to have their exchanges up and running, enrolling people on October 1. Their success would demonstrate that the Affordable Care Act is working and would quiet critics like Sen. Max Baucus (D-MT), who recently warned of a “huge train wreck coming down” on exchange implementation. President Obama acknowledged that launching the exchanges is “a big, complicated piece of business.”

Nationally, the state exchanges are expected to serve as a key mechanism in extending health coverage to an estimated twenty-seven million uninsured Americans by 2016 and in fostering competition that will curb health care cost growth. Nearly 1.6 million New Yorkers are projected to access coverage through the state’s exchange.

“There are a lot of eyes on New York,” says Donna Frescatore, a Cuomo health policy adviser and former state Medicaid director whom the governor appointed executive director of the exchange last July. “We’re a large state, and we have the opportunity to significantly reduce the number of uninsured. There are a lot of very interested folks rightfully asking us good questions.”

Skepticism Persists

Whether they know it or not, New York’s 2.7 million uninsured residents—16 percent of the state’s nonelderly population—have a lot riding on the exchange’s success. One of them is Cynthia Morgan of Dunkirk, a town on Lake Erie south of Buffalo.

Morgan, a fifty-eight-year-old former hotel manager, has been out of work and uninsured for the past three years. The lack of insurance has been especially difficult because she has a heart condition, takes eight different prescription drugs, and—after a bad car accident—had to pay off $7,000 in medical bills out of pocket. She hasn’t been to the doctor, even at a free clinic, in a year because she can’t afford the preventive screening tests.

After learning that her family’s income is too high for her to qualify for Medicaid, Morgan looked into buying private coverage but found it would cost her at least $300 a month—an unaffordable chunk of her husband’s $1,700 monthly Social Security check. She’s a prime candidate for the New York exchange.

Morgan admits that she doesn’t know much about the Affordable Care Act or the exchange. And when she is told that people like her with a household income of less than 400 percent of the federal poverty level will qualify for either expanded Medicaid or federal subsidies to help them buy coverage, she is skeptical.

National polls show that most Americans in her position also lack knowledge about the health care law’s benefits. A recent Enroll America survey found that 78 percent of uninsured people did not know they will have access to “a quality health insurance plan” that they can afford. In addition, 42 percent of Americans were unaware that the Affordable Care Act was still in effect, according to a recent Kaiser Family Foundation survey.

Morgan can envision what it would mean for her if the law’s promise is fulfilled. “Oh, God, that would be great—if there’s going to be a plan that’s affordable,” she says. “But come on now, it’s really hard to believe.”

The fate of the New York exchange will depend heavily on the state’s effectiveness in getting the word out and enrolling uninsured people like Morgan. It also will hinge on signing up small businesses—those with fewer than fifty-one full-time employees—to buy coverage for their employees in the state’s separate Small Business Health Options Program, known as the SHOP exchange. Many small businesses currently don’t insure their workers, saying they can’t afford to do so.

Enrollment in New York’s individual exchange is projected to reach 615,000 and another 450,000 in the SHOP exchange. Nearly 60 percent of those expected to sign up in the individual exchange were previously uninsured. It’s estimated that another 510,000 uninsured people will be eligible through the exchange for Medicaid or the state’s Child Health Plus public coverage, including 75,000 who will be newly eligible under the expanded Medicaid program and 435,000 who are currently eligible but not enrolled.

But many observers are nervous. As of early May, the New York Department of Health had not announced a plan for public education, outreach, and enrollment. It has received applica-
tions from organizations seeking to provide “navigator” services to help individuals and small businesses interested in buying coverage through the exchange. The department is not expected even to announce what navigators it has chosen to work with until July.

“We’re concerned about the timing,” says Elisabeth Benjamin, vice president of health initiatives for the Community Service Society of New York, which runs a consumer assistance program that helps people with questions about health insurance. The organization has applied to set up a statewide navigator network. “To get people trained as navigators by the time of open enrollment seems unlikely.”

Early Stumbles
Despite ongoing concerns, stakeholder groups are relieved that New York’s state-run exchange was established in the first place. That almost didn’t happen because of a combination of timing, a busy legislative agenda, and conservative opposition to President Obama’s health reform law.

In June 2011 Governor Cuomo reached an agreement with the leaders of both houses of the state legislature—the Assembly is controlled by Democrats, the Senate by Republicans—on a bill to establish a state exchange run by an independent public authority, governed by a board of representative stakeholders. Initially, Cuomo had envisioned an exchange that would engage in aggressive selective contracting with health plans, while Senate Republicans and the health insurance industry preferred an open-market model that would allow any plan meeting exchange criteria to participate. The legislation that moved forward was a compromise.

The Assembly passed the bill, which then went to the Senate—where it was expected to pass. The Senate Republican Conference took the bill up on June 23, 2011, the next-to-last night of the legislative session, which had been consumed with controversial bills on same-sex marriage and capping property tax growth. Senate Health Committee chair Hannon says GOP leaders simply decided they didn’t have time to consider the complicated exchange bill. Its failure stunned everyone.

Governor Cuomo reintroduced the bill early in the 2012 legislative session as part of his proposed budget. But by then the presidential election campaign was in full roar, and fiery opposition to “Obamacare” had become a litmus test within the national Republican Party. The longtime Assembly Health Committee chair, Richard Gottfried (D–New York City), says state Senate Republican leaders refused to take up the exchange bill, arguing that the issue would be moot if the US Supreme Court struck down the Affordable Care Act or Obama was not reelected.

Soon after, Governor Cuomo announced that he had analyzed state law and concluded it allowed him to order the Department of Health to set up the exchange as a bureau within the department, although he couldn’t unilaterally establish an independent public authority to run the exchange. He issued his executive order April 12, 2012.

“We were lucky here that we have a strong governor who said it was ridiculous to wait until it would be too late to set up our own exchange,” says the Community Service Society’s Benjamin. “From a consumer perspective, that was the right call.”

After the governor issued the order, Gottfried says, “there was not a peep of controversy. That’s because while Senate Republicans may not have wanted their fingerprints on it, all the stakeholders, including the insurers, very much wanted an exchange and they didn’t want Washington running New York’s insurance market.”

The extended legislative impasse delayed exchange implementation to some degree. In the interim, however, the New York State Health Foundation supported a number of studies, including reports about consumer protections, customer assistance, key business functions of the exchange, and the role of brokers. The results of these studies helped the state get off to a fast start once it finally established an exchange.

Since Governor Cuomo’s executive order, New York has received nearly $370 million in federal implementation grants. Under the Affordable Care Act, every state exchange must be financially self-sufficient by 2015. New York has not yet announced how it plans to finance the exchange’s day-to-day operations after 2014, although it’s expected to impose user fees, as most states probably will. The budgeted 2014 operating cost of $120 million will be fully funded by the federal government; over the two years that follow, the budget drops to $97 million, then $75 million.

In most states with an exchange, the legislature created an independent public authority to oversee the development and operation of the new marketplace. The long-term impact of New York’s less common approach remains to be seen.

The Cuomo-ordered exchange is housed within New York’s Department of Health, an executive branch agency that oversees Medicaid, other public insurance programs, and some health maintenance organizations. But it is the state’s Department of Financial Services that oversees other types of commercial health plans.
“It’s one of those ironic things that it’s probably working out better than the original concept,” Hannon says. “You have people sticking with their areas of competency, and you avoid duplicate functions.”

But others, including some who generally praise the Department of Health’s work on the exchange, say that having the exchange within the executive branch rather than under an independent public authority has led to less transparency and public engagement. Austin Bordelon, an analyst with Leavitt Partners, which tracks exchange efforts nationally, says that compared with Oregon—a pacesetter in transparency—New York has provided little visibility into its exchange development process.

The Community Service Society’s Benjamin agrees in part. “Press outreach and external affairs are very tightly controlled,” she says. “It’s not that we don’t trust them, but people are feeling nervous that we haven’t had a public stakeholder meeting since last November. The state feels a little bunkered in.”

Building On A Strong Foundation
Compared with other states’ exchanges, New York’s exchange started off with some major advantages—as well as some distinct disadvantages.

The most obvious advantage is that the state has a strong tradition of regulating health care markets that’s widely accepted by stakeholder groups and both Republicans and Democrats. As a result, when the New York exchange announces plan premiums later this summer, consumers are unlikely to experience the so-called rate shock that purchasers in most other states may experience.

Across the country, health plans have warned that they’ll have to jack up premiums because of the Affordable Care Act’s requirements: Starting January 1, 2014, all health plans must accept applicants without regard to preexisting medical conditions and must limit the differences in the premiums they charge that are based on age, sex, and medical condition, so that no one group pays more than three times what another group pays. Younger, healthier people will pay more, and older, sicker people will pay somewhat less.

The difference in New York is that the state already requires insurers to accept all applicants in the individual and small-group markets. Regulators also have established a system in which insurers have to charge everyone in the same market the same premium, regardless of age or health status.

When implemented in the 1990s, these rules led to a sharp increase in premiums, particularly in the individual market, and a dramatic reduction in the number of New Yorkers purchasing coverage in the individual market. Only about 17,000 people now have such insurance, and they each pay as much as $1,300 a month. Today, the same rules are expected to ease New York’s transition into next year’s reformed insurance market.

A recent Society of Actuaries report projected that premiums in New York’s individual market would decrease 13.9 percent in 2014. That would be the largest drop in the country. In states with little or no previous insurance market reforms, rates are projected to increase as much as 81 percent.

“The bad news is we’ve been paying high rates all along,” says David Sandman, senior vice president of the New York State Health Foundation. “The good news is they won’t get worse and will probably get better.”

Another advantage is that unlike some states that are dominated by a small number of insurers and provider systems, New York has relatively robust competition in both the insurance and hospital markets in many of its regions. There are nearly forty insurers doing business in the state, including about a dozen with significant market share.

As a result, most observers predict that New York’s exchange will offer an adequate number of health plans in each regional market—a major worry for exchanges in other states. Participating plans may include national insurers like Oxford and Aetna; nonprofit health maintenance organizations (HMOs) such as the Capital District Physicians’ Health Plan; Blue Cross Blue Shield plans, including Empire and Excellus; the state’s nonprofit CO-OP (Consumer Oriented and Operated Plan), the Freelancers Health Service Corporation; and plans sponsored by hospital systems. The exchange also may include Medicaid managed care plans, such as Fidelis, that obtain commercial licenses to serve exchange customers.

“I think there probably will be six or seven plans participating in the small-group exchange in most of the twenty-four counties we cover,” predicts Robert Hinckley, chief strategy officer for the Capital District Physicians’ Health Plan, whose Albany-based HMO serves 400,000 commercial, Medicare, and Medicaid members. “We’re planning on being active in the individual exchange as well. I’m optimistic there will be participation. I think most of the plans are looking at this as a defensive play to keep the groups they have.”

In addition to the New York exchange’s built-in advantages, some clear challenges remain. With a highly diverse population of nearly twenty
Tough Decisions Ahead

Even with those reassurances, stakeholder groups are fretting because there is so little time before October 1 to work through the enormous challenges and myriad policy decisions involved in setting up a working exchange.

Health plans had to scramble to file applications to offer products on the exchange, including listing their proposed rates, by the end of April 2013; the invitation to plans only went out February 1. Meanwhile, plans continue to negotiate with hospitals and other providers to line up their networks. The Department of Health says it won’t announce what plans will be offered on the exchange, their premiums, and their networks until later this summer.

Health plans are concerned about whether enough young and healthy people will sign up for exchange coverage to lower the overall premiums. They also are worry about whether the Department of Financial Services, which has premium approval authority, will approve rates that will be adequate to cover the costs of the exchange risk pool. Given how small the individual market has been until now, New York insurers have less experience than those in other states when it comes to setting rates for individual purchasers.

“Our concern is plans will come in at one rate level, the Department of Financial Services will come back with a rate that’s substantially less, and then there’s the question of whether plans will participate in the exchange or not,” says Paul Macielak, president of the New York Health Plan Association. “We’re concerned about allowing enough time for a dialogue.”

Hospitals also fear that many consumers will choose plans with lower premiums and higher cost sharing, forcing providers to spend more time collecting copayments and coinsurance from patients—a task they loathe. “If there’s a migration to bronze and silver plans with higher copays, as there was in Massachusetts, we will have increased headaches,” Gold says. “Chasing individual patient responsibility is one of the hardest things for hospitals to do, and we’d love not to do it.”

Small-business owners express uncertainty about whether premiums for plans offered through the exchange will be affordable. Additional costs from mandated essential health benefits, a health insurance tax required by the Affordable Care Act, and the surcharge that the exchange is likely to impose to cover its own administrative costs all could drive up premiums.

The equation is somewhat different for businesses with twenty-five or fewer employees and average wages of less than $50,000. Those businesses will be eligible for a sliding-scale tax credit if they buy coverage through the SHOP exchange and pay at least half of the premiums for their workers. Yet many small business owners remain skeptical that the exchange will be a financially attractive proposition.
They also wonder whether their employees will have a choice of plans through the SHOP exchange, or whether it will be the business owner’s responsibility to pick a single plan for all employees. According to a survey conducted by New York exchange officials, Frescatore reports, 76 percent of small-business owners said that they would like their employees to have a choice of plans in the SHOP exchange. The Obama administration had intended to require state SHOP exchanges to offer small-group employees that choice, but it has delayed implementing the rule because it’s technically difficult for the exchange to let each employee enroll in a separate plan. New York’s SHOP exchange nevertheless intends to go ahead and offer each worker at participating small businesses a choice of plans.

Under that model, employers will contribute a fixed amount every month to cover their employees through the SHOP exchange. Each employee will apply those funds to a plan that he or she chooses, paying the difference if the premium is higher than the employer’s contribution.

Complicating matters is the fact that the SHOP exchange will not be the only place where small businesses can buy group coverage. A growing number of employee benefit firms are launching private exchanges—such as HealthPass in New York—which offer employers administrative support and a choice of health plans for their workers. In addition, most small employers in New York buy health insurance through brokers, and the broker community remains skeptical about the SHOP exchange.

“What you may see is plans outside the exchange that are more creative in their benefit packages that may fit better with particular consumers,” says Dick Poppa, CEO of the Independent Insurance Agents and Brokers of New York, a trade association. “There certainly is conversation about, ‘What if we have an exchange and no one comes?’”

Meanwhile, consumers are waiting to see whether federal subsidies will make premiums and cost sharing in the individual exchange affordable enough for the most vulnerable consumers. Much depends on how many people sign up, and who they are. If enrollment is both heavy and balanced between healthier and sicker people, premiums may stop climbing or even drop. But if mostly sicker people sign up, rates could rise even higher.

Everyone is wary of predicting how successful enrollment will be at the start, especially given the relatively small federal tax penalty that individuals will have to pay if they do not obtain insurance. “Whatever the rate is, for someone who doesn’t have insurance today, it’s going to be more than they want to spend and more than the penalties, and that will dampen the take-up,” says the health plan association’s Macielak.

**The Final Push**

For their part, Frescatore and her fellow exchange officials face numerous challenges, including the urgent need to get a smoothly functioning web portal up and running to enroll people by October 1. New York has hired Virginia-based Computer Sciences Corporation, which also runs its Medicaid billing system, to design the exchange web portal.

Exchange officials envision one-stop shopping online, where individuals and families can sign up for subsidized or unsubsidized private plan coverage, Medicaid coverage, or the state’s Child Health Plus coverage. Their goal is to have the system automatically funnel applicants into the program for which they qualify and then present them with that program’s coverage options. The exchange also will offer telephone assistance, and navigators and brokers will be available to give consumers help in person.

Exchange officials also are counting on the federal government’s data hub to be operational by the time enrollment begins. The hub, now in testing, aims to provide a real-time link to information from the Internal Revenue Service, Department of Homeland Security, and other federal agencies. That connection will enable the exchanges in New York and other states to instantly determine applicants’ eligibility to participate and receive federal subsidies to buy coverage.

On top of all this, exchange officials still have a major decision to make: Will they choose which plans will be offered? Or will any plan that qualifies be allowed to participate? Governor Cuomo prefers the former—a selective approach that Massachusetts took as part of its earlier reform efforts and that California officials intend to implement as well. Although New York exchange officials haven’t announced any explicit policy on this, they have signaled that they want to take a middle road between aggressively limiting plan participation and letting everyone play. But first they want to see what products insurers have proposed in response to the plan invitation.

The New York State Health Foundation’s Sandman suspects that exchange officials at first will not be very aggressive about selective contracting. “The thinking is, let’s create an attractive marketplace that health plans want to participate in,” he says. “If we have a working model, we can raise standards and use more purchasing power later. But let’s not sink this ship before it even starts to sail.”

Under the Affordable Care Act, insurance...
products offered through the exchanges must fit within bronze, silver, gold, and platinum tiers that range from covering 60 percent to 90 percent of a policyholder’s total health care costs. The act also allows a catastrophic, high-deductible tier for people younger than thirty. All products offered both inside and outside the exchange must cover at least an essential benefit package that is actuarially equivalent to the state’s chosen benchmark plan—which in New York is Oxford’s exclusive provider organization, a popular plan currently available to small groups in the state.

Some experts fear that within each tier, insurers will offer many different and potentially confusing plan variations. “We heard that too much choice is overwhelming and consumers need to have manageable choice,” Frescatore says. “But we also wanted to preserve plan innovation. We wanted to come up with an approach so consumers could have an apples-to-apples comparison of exchange offerings in terms of premium, cost, provider network, and quality ratings.”

The insurance industry seems comfortable with New York’s approach so far. “Unlike other states, New York hasn’t said anything about moving to selective contracting,” says Macielak. “You can go to regions of the state where there are maybe three plans, and we don’t know if all three intend to participate in the exchange. I don’t know how selective you want to be.”

Looking at the multitude of challenges and the tight time frame for implementing the exchange in New York and other states, politicians and pundits already are predicting a difficult road. Even President Obama recently said, “Even if we do everything perfectly, there’ll still be...glitches and bumps.”

Across the country, Republican elected officials have blocked state-run exchanges in most states, adding to federal officials’ burden and increasing the chances of problems. Congressional Republicans have also refused to approve President Obama’s budget request for $1.5 billion next year to help implement the exchanges and conduct a broad public education campaign about enrollment.

Political observers say that Republicans hope to exploit exchange snafus to argue that “Obamacare” is a failure and to make gains in the 2014 congressional elections, with an eye to rolling back or repealing the landmark health care law. “If it crashes and burns on October 1,” Sen. Johnny Isakson (R-GA) recently warned the federal official in charge of exchange implementation, “you’ve got a huge problem.”

The stakes for leading reform states like New York are high, and New York officials are acutely aware of that. “If we can’t do it well here, that will undermine people’s confidence overall,” says Assembly Health Committee chair Gottfried. “It’s important that we not screw it up.”

NOTES

Errata

LEE ET AL., JULY 2013, P. 1251 Some of the biographical information in this article was inaccurate. Middle initials were omitted for Matthew L. Maciejewski and Shveta S. Raju. In addition to the information provided, Maciejewski’s affiliation should contain the following additional text: “Matthew L. Maciejewski is a research career scientist at the Center for Health Services Research in Primary Care, Durham Veterans Affairs (VA) Medical Center.” In Raju’s affiliation, the Center for Health Services Research in Primary Care is at the Durham VA Medical Center. The article has been corrected online.

MEYER, JUNE 2013, P. 1026 The ninth paragraph of the section “Building On A Strong Foundation” incorrectly identifies New York State’s nonprofit CO-OP health insurance plan as the Freelancers Insurance Company. The CO-OP’s correct name is the Freelancers Health Service Corporation. It is independent of the Freelancers Insurance Company. The article has been corrected online.
Organizing Uninsured Safety-Net Access to Specialist Physician Services

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Journal of Health Care for the Poor and Underserved, Volume 24, Number 2, May 2013, pp. 741-752 (Article)

Published by The Johns Hopkins University Press
DOI: 10.1353/hpu.2013.0076

For additional information about this article
http://muse.jhu.edu/journals/hpu/summary/v024/24.2.hall.html
Organizing Uninsured Safety-Net Access to Specialist Physician Services

Mark A. Hall, JD

Abstract: Arranging referrals for specialist services is often the greatest difficulty that safety-net access programs face in attempting to provide fairly comprehensive services for the uninsured. When office-based community specialists are asked to care for uninsured patients, they cite the following barriers: difficulty determining which patients merit charity care, having to arrange for services patients need from other providers, and concerns about liability for providing inadequate care. Solutions to these barriers to specialist access can be found in the same institutional arrangements that support primary care and hospital services for the uninsured. These safety-net organization structures can be extended to include specialist physician care by funding community health centers to contract for specialist referrals, using free-standing referral programs to subsidize community specialists who accept uninsured patients at discounted rates, and encouraging hospitals through tax exemption or disproportionate share funding to require specialists on their medical staffs to accept an allocation of uninsured office-based referrals.

Key words: Safety net, uninsured, specialist access.

In much of the U.S., safety-net access for the uninsured is unorganized and uncoordinated, especially for office-based specialist services. For emergency care, federal law requires hospitals participating in Medicare to screen and treat regardless of ability to pay. For other hospital services, only tax-exempt institutions are required by federal and many states’ laws to have charity care policies that provide free or discounted care to needy patients. Office-based specialist services usually are not included.

For primary care, community health centers (CHCs) provide access to a broad range of services, and free clinics offer more basic services for urgent or acute care. These institutions typically are not affiliated with hospitals, however, and they usually offer only limited access to specialist physicians and diagnostic testing. As a result, specialist care is the component of the safety net with the most gaping holes.

A 2002 national survey of 607 general internists concluded, “It is particularly difficult for uninsured patients to secure laboratory tests and diagnostic procedures.” Less than 10% reported that their uninsured patients often could obtain diagnostic or laboratory tests at reduced costs and only 22% were often able to refer uninsured patients to a specialist when needed. Community health centers have similar experiences. In a 2004 national survey of 439 CHC medical directors, 30% said that uninsured

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patients are rarely or never able to obtain access to specialized referral services, and 50% said the same for high-tech services. Similar conditions were documented in California, in 2003. Accordingly, when uninsured people need specialized services, they rely heavily on hospital emergency rooms.

There are also significant gaps in uninsured access to hospital and primary care services, but respectable levels of access to these components of care exist in many locations. For prescription drugs, pharmaceutical companies donate expensive branded drugs to people in need who apply, and subsidized pharmacies provide generic medications at low cost. Where hospital or primary care access is deficient, the Patient Protection and Affordable Care Act of 2010 makes substantial improvements by expanding community health centers and requiring nonprofit hospitals’ to have more explicit financial assistance policies. Sorely missing, however, is any promising initiative to improve access to specialist physician services for the 20 million or more who will remain uninsured following implementation of health insurance reform. Some metropolitan areas with public or academic hospital systems have organized safety-net systems that provide qualified uninsured patients membership in a structured or coordinated system of care that includes a primary care home and access as needed to prescription drugs, testing, specialists, and hospital services. Leading examples are based in Boston (prior to statewide insurance reforms), Dallas, Denver, Richmond, San Francisco, and San Antonio. However, efforts have stalled or failed to replicate these coordinated programs in other communities.

This article analyzes why this state of affairs exists, and proposes ways it might be remedied. The analysis draws from existing literature to identify known or apparent barriers to office-based physicians’ provision of charity care and to summarize how effective existing safety-net programs of different types have been in addressing these barriers, and the reasons for their shortfalls. The article then describes what might be called public policy levers that can be used to improve support for specialist physician service to the uninsured, especially levers that encourage more office-based specialists to accept referrals of uninsured patients at reduced rates.

The Problem: Barriers to Charity Care by Office-Based Physicians

Although office-based physicians provide substantial amounts of free or discounted care, specialists in general provide considerably less charity care than do primary care physicians (with the notable exception of surgeons). Moreover, treatment of uninsured patients has become increasingly concentrated in safety-net institutions, such as hospitals, free clinics, and community health centers. As measured by the Community Tracking Survey, physicians who work in medical schools provide about four hours more charity care per month than physicians in solo or two-person practices, and salaried physicians in group settings do 3.5 hours a month more, controlling for other practice characteristics (such as specialty, payor mix, physician wage, and years of practice).

This institutional concentration of safety-net access affects both primary and specialty care. For primary care, institutional concentration is seen in statistics regarding uninsured patients’ usual source of care. In 2009, among adults with a usual source of care, the source was a doctor’s office for 48% of uninsured people, compared with
74% of nonelderly adults overall. 21 Thirty-nine percent of uninsured adults with a usual source of care used a clinic or health center, and 10% used a hospital, compared with 21% clinics and 3% hospitals for nonelderly adults overall. Institutional concentration is even more noticeable by focusing more specifically on providers who reduce rates based on ability to pay. Among uninsured people in 2003 whose usual provider offered such discounts, only a third of these providers were office-based physicians; the rest were clinics, health centers, or hospitals. 22

This institutional concentration fails to overcome the greater difficulty uninsured patients face in accessing specialist care. Therefore, we must learn more about why these institutional arrangements have arisen and what is required for them to include more specialists. To begin, this article surveys existing literature on how these institutions overcome various barriers faced by office-based physicians who consider providing free or discounted care to uninsured patients in their private practices.

Physicians' difficulty in determining need. A century ago, much physician charity care in larger cities shifted from private offices to what were called dispensaries, which in many ways are the antecedents of modern day free clinics and community health centers. 23 Various social and institutional features caused this shift, but one notable factor was physicians' increasing difficulty in determining which patients needed charity care. 24 The prototypical 19th century small-town physician treated all members of the family from birth to grave and with frequent house calls, and so had intimate knowledge of patients' economic circumstances. 25 As these professional relationships changed with urbanization, so did the institutional structure of charity care.

Similarly, today physicians have only limited ability to know why patients seek free or discounted care, and specialists have even less continuity or history with patients than do primary care physicians. Verifying insurance status and residence is routine, but this is less feasible for income or assets. Structured safety-net programs can screen members for all relevant factors that determine threshold eligibility and the appropriate discount level. It is inefficient for a physician's office to do these tasks unless it expects to serve a large number of uninsured patients.

Professional ethics. Few private physicians view their professional responsibility as doing all they can to treat the underserved. Instead, most recognize their responsibility to do only their fair share. 26 For the most part, this takes the form of providing free or discounted care to existing patients who lose their insurance, rather than opening their doors to any and all people without insurance. A 2002 national survey of 607 general internists, for instance, reported that for only a third were most uninsured patients new patients; for half, most of their uninsured were established patients who lost their insurance. 5 This natural tendency to favor existing patients is another reason we expect to see less charity care among specialists, since more of their patients are new or recently established. Specialists might be expected to accept some charity cases as a professional courtesy to referring colleagues, but primary care physicians are reluctant to refer patients they think their peers might resent due to difficulties in paying. 7

Another deterrent to an open-door policy is that physicians naturally are concerned that having more generous or visible charity policies than their peers will attract more than their share of needy patients or more than they are willing to accommodate. Physicians have no ready means to determine how many charity patients their peers are
accepting, or on what terms, so there is little professional or peer pressure to increase what they do. Instead, as more physicians move into larger group practices, which tend to do less charity care,19 more structured or revenue-focused approaches to their practice management are likely to keep a check on any inclination to increase the amount of office-based charity care.

Safety-net institutions overcome these barriers by embracing care for low-income uninsured people as their institutional mission. Accordingly, they receive substantial financial support to help carry out that mission, such as grants, donations, and supplemental payments from Medicare and Medicaid.

Physicians’ ability to meet patients’ needs. Another concern office-based physicians have is being unable to provide adequate care to uninsured patients who lack resources to pay for services or medications the physician cannot provide directly.27,28 Physicians and patients find it frustrating, and ultimately not very helpful, to determine that a patient requires referral for an expensive test, procedure or medication, but not be able to arrange for affordable care. Safety-net institutions address this problem by using their resources to provide more comprehensive care, and to assist patients with arranging discounted referrals or donated services.

Physicians’ liability concerns. Physicians sometimes cite the risk of tort liability as a reason for avoiding an financially or professionally disadvantageous arrangement.29 Although poor patients are actually much less likely than others to sue,30,31 physicians may be unaware of these statistics, and they may perceive greater risk of being sued due to limits noted above in their ability to obtain necessary referral services.28 There is some basis to believe that law does not clearly protect physicians from responsibility for necessary treatment that patients decline due to cost concerns.32 Moreover, legal protections for “charitable immunity” expressly do not apply in non-institutional settings (except in emergencies).33,34 These liability concerns are greatly diminished in institutional settings, which qualify for charitable immunity or absorb the liability cost.

Possible Solutions and their Institutional Limits

Two types of safety-net institutions are able to overcome these barriers, at least to some extent.

Free clinics and community health centers. There exist over 1,000 free clinics and 8,000 community health centers in which physicians and others donate substantial time to caring for needy patients.2,35 These clinics solve the various barriers noted above by determining patient eligibility or providing care to anyone who seeks it regardless of ability to pay; allowing physicians to volunteer for a fixed number of hours; and providing some or full liability protection.

There are several notable limitations, however. First, despite substantial numbers, their capacity and geographic coverage are limited. Safety-net clinics are especially sparse in rural areas,35,36 but also in suburbs that lack a high concentration of low-income uninsured people.37 Second, CHCs usually provide only primary care,10 and free clinics often limit themselves to acute or urgent care, or their limited resources permit only sporadic access.2 In 2009, federally-qualified health centers reported that
only 0.3% of their clinical personnel were specialists (apart from dental care, mental health, pediatrics, or obstetrics), and specialists services accounted for only 1.3% of visits.

Third, community clinics often are not integrated or coordinated with other elements of local delivery systems. To achieve federal qualification for grants and more generous reimbursement, CHC boards must have a majority of patient members, making it difficult to affiliate formally with hospitals or other providers. Finally, free clinics are structured to provide care only to the most economically needy patients rather than to administer sliding fee scales based on ability to pay. Changing this no-charge policy might jeopardize free clinics’ funding or their liability protection, which arises from state and federal laws that confer charitable immunity on volunteers at free clinics and other nonprofit organizations.

Specialist referral programs. Several dozen communities around the United States—some large, and some quite small—have organized programs that recruit office-based physicians, including specialists, to accept a fixed number of low-income uninsured referrals for free, or for only a modest copayment. Most such programs focus on specialist physicians because of their greater need, and some use electronic referrals or remote consultations.

These volunteer specialist referral programs began as early as 1985 in Kentucky, and they were brought to wider prominence by the success of the Project Access program in Asheville, North Carolina. The organizational support for these referral programs varies, but typically they are founded by a local medical society, a hospital, or a community group. Comprehensive statistics are lacking, but program sizes range from only a few hundred patients annually in many locations to 1,000 or more in Dallas and Wichita, to 3,000 annually in Asheville.

Where they exist, these referral programs have the potential to overcome the key barriers even more effectively than primary care clinics. By screening and allocating patients, they can address physicians’ concerns about patient neediness and the fairness of volunteer distribution. By recruiting broadly from the local medical community, they are able to capitalize on professional peer pressure to encourage widespread participation—often including well over half of area physicians. Critically, these referral programs usually include nearly a full range of specialists. Many also include laboratory and diagnostic testing, prescription drug access, and medical equipment.

Owing to their organizational flexibility, these referral programs are able to, and usually do, coordinate with other safety-net providers in the area, so that qualified patients receive most necessary services. Finally, some, but not all, referral programs are able to qualify for volunteer service immunity under state law. Those without this protection report that liability concerns are not a barrier to recruiting physicians because those who participate in referral programs are active physicians who already have liability insurance at a set price.

Specialist referral programs also face several limitations. First, despite their proliferation, they ultimately serve only a limited number of people. Considerable effort and significant funding is required to launch and maintain them, and many communities lack the necessary leadership or resources. Second, like free clinics, most are designed to provide care to those who qualify for full charity, and are not currently arranged
to charge patients a sliding fee according to the degree of financial need. Physicians’ willingness to commit substantial capacity to organized charity care programs may be greatly diminished once health insurance reform is fully implemented. Then, many or most low-income people who are currently served by these programs will be eligible for Medicaid or for heavily subsidized private insurance.

The referral model can be adapted to overcome these two limitations. At least one program allows physicians to charge patients substantial fees under a sliding scale, and others permit modest copayments ($5–10). Administratively, this is very feasible since central screening can determine level of need, leaving to individual physicians’ offices the tasks of charging and collecting fees for services they provide. Moreover, if these programs allowed sliding fee scales for middle-income patients, more communities might find the resources and institutional will necessary to establish the programs. Following implementation of the ACA, the uninsured will continue to include people who face unaffordable insurance premiums (and thus are not subject to individual mandate), even though they earn several times more than the poverty level and thus can afford to pay significant amounts toward the cost of their care. Existing specialist referral programs for the uninsured appear to have the adaptability that is needed to include an expanded range of deserving circumstances, judging from the variety of these programs and their diversity of location. What is lacking, though, are more focused public policies and funding sources to support and encourage this successful model and its variations.

Public policy levers for improvement. Several public policy options are available or emerging to promote organized participation of office-based specialists in structured safety-net programs for the uninsured.

Community health center funding. Community health centers face considerable uncertainty over the extent to which federal and state law permits them to provide specialist care. Various legal provisions that either provide higher reimbursement or more permissive or protective regulatory treatment are restricted to specified services, which usually are focused on primary care. Were additional funds and permission provided, CHCs probably would be eager to pay for specialist referrals. Many non-metropolitan communities, however, still lack CHCs, and many are probably too small to support one, or they lack the necessary concentration of disadvantaged people to warrant one. Therefore, other approaches are still needed.

Uncompensated care pools. Another possibility is to make expanded use of the uncompensated care pools that exist in several states. These pools are funded jointly from federal and state sources and typically cover low-income uninsured people, as an alternative to expanding Medicaid (in states that expand Medicaid). Conventionally, uncompensated care pools cover only hospitals and clinics and exclude office-based physicians. Possible reasons include allocating limited funds to the most compelling needs; relying on funding sources that restrict their use to hospitals and CHCs; wanting to control costs and coordinate care by covering only services provided in managed care settings; and administrative difficulties including and auditing a much larger number of providers that do not have a high concentration of covered patients.

These explanations have not received close evaluation, so they should be reviewed with an eye to whether they can be remedied. One apparent remedy might be to com-
Compensate CHCs or free-standing programs that reimburse office-based specialists for treating qualified uninsured patients who are screened and referred. Given a source of payment, many physicians, including specialists, might be willing to accept uninsured patients at discounted rates similar to those paid by Medicaid. In 2004–2005, three-quarters of physicians accepted at least some new Medicaid patients,\textsuperscript{19} although the rate varied considerably across locations.\textsuperscript{51}

Some safety-net programs, however, must pay community physicians at Medicare rates, or at rates substantially above Medicaid rates, in order to secure sufficient capacity for specialist referrals.\textsuperscript{52} However, funds are not sufficient to pay market rates for all patients in need, and these programs lack the leverage to convince enough private physicians to accept the below-market payments or sliding fee scales that one expects for lower-income uninsured patients. Additionally, the ACA will substantially reduce the federal funding used to support these pools. Therefore, stronger measures may be needed.

**Hospital medical staffs.** One potential lever exists in the form of hospital staff membership. Many hospitals are at the center of their local safety nets, including in smaller communities where they often play a key role in supporting primary care physicians who provide office-based charity care.\textsuperscript{53} One might also look to hospitals to be more active in organizing comprehensive safety-net programs that include medical staff specialists. Legally, hospitals could require medical staff members to accept a fixed number of office-based referrals either on a sliding scale basis, or at discounted Medicaid rates. This would be similar to how hospitals commonly now require physicians to serve rotations on call or in the emergency room—the main place many uninsured and Medicaid patients currently obtain specialty care.

For many hospitals, however, it would be difficult or impossible to require on their own initiative that medical staff members accept uninsured referrals in their private offices. Hospitals already face considerable resistance from physicians asked to serve emergency room rotations, and frequently hospitals must compensate physicians for doing so.\textsuperscript{54,55} Physicians have leverage to resist in markets that have competing hospitals to which physicians might shift their practices. This threat is especially realistic where for-profit hospitals lack comprehensive safety-net service as part of their core mission. And, the threat is acute in communities where key specialists practice in a single group, since one switch could deny a hospital any coverage of an important clinical area. Therefore, additional support is needed to encourage hospitals to take on an expanded safety-net role.

**Disproportionate share hospital (DSH) funds.** Because health insurance reform will cover half of people who are currently uninsured, the Affordable Care Act reduces the “DSH payments” under Medicaid and Medicare for hospitals that serve a disproportionate share of low-income patients. At the same time, however, the Act requires government to revisit how remaining Medicaid DSH funding is allocated among states and hospitals. Policy analysts have roundly criticized existing DSH payment allocations for failing to target more deserving facilities.\textsuperscript{56,57} Revisiting this misallocation presents an opportunity to consider how best to reward hospitals’ safety-net role.

Currently, DSH funds are intended primarily to help hospitals defray their own costs in treating uninsured patients. However, a revised formula for DSH fund allocation
also might give hospitals some credit for services provided by their medical staff members, even to their office-based patients, under a hospital-organized safety-net program. If so, this credit might induce more hospitals to facilitate out-patient referrals of uninsured patients to specialists’ private offices, and might provide funds earmarked to pay these physicians at least partial compensation, thereby reducing their resistance. The difficulty with this approach, however, is that DSH funds are diminishing and so may not be sufficient for their original purposes, much less for these expanded goals. Accordingly, additional inducement to accept uninsured patients is probably needed.

Hospital tax exemption. Nonprofit hospitals are under increasing legal pressure to justify their tax-exemption by showing quantifiable community benefits.58 Hospitals include discounted or free charity care in their community benefits ledgers, but only for care the hospital provides. Expanding the community benefit concept to include non-hospital services arranged by hospitals might provide additional impetus to structure office-based referral programs using hospital staff members.59

Legally, facilitating safety-net services outside the hospitals’ walls can count in a quantified community benefits standard.60,61 The Internal Revenue Service reporting form (known as Schedule H) includes “coalition building” and “community health improvement advocacy” aimed at improving “access to health care services.” There is an important limitation, however. Hospitals can count only their own costs for these efforts.33 They apparently cannot claim the value of services donated or discounted by independent providers, even if the hospital arranges for the services by organizing the referral program and recruiting the participating physicians. Federal and state authorities should revisit this limitation to consider whether, in the proper circumstances, hospitals might receive at least partial credit for physician services. One justification is that physicians themselves cannot claim tax exemption; therefore, no double-counting will occur if hospitals claim some credit.

Conclusion. Safety-net access for the uninsured is concentrated in institutions for a reason. Institutions effectively overcome the natural barriers that limit the extent of office-based charity services that physicians provide. But, as currently structured, the major safety-net institutions fail to include sufficient capacity for specialist services, even for the limited primary care populations they serve. This shortfall occurs because most safety-net funding sources are focused on primary care or hospital services.

Although the Affordable Care Act will greatly reduce the number of uninsured, at least 20 million people are expected to remain uninsured. For them, problems of access will likely intensify, since most financially needy people who are legal residents will be covered by Medicaid (in states that expand Medicaid) or highly-subsidized private insurance. Therefore, most of the remaining uninsured will be well above poverty, even though they still cannot afford insurance, or will be undocumented or short-term immigrants62—demographic characteristics that are likely not to inspire strong public and professional sympathies.

One possible approach could be modeled on the dozens of volunteer referral programs that currently exist for specialist physicians. Even though their volunteer aspect is unlikely to spread widely, these programs are useful models for how coordinated safety-net access might be structured for sliding-scale physician services that are not based at safety-net facilities. Forming and supporting these programs, however, requires
substantial effort and resources, which requires us to revisit the merits of institutional organization. Any realistic effort to structure specialist care into uninsured safety-net access systems on a wide scale basis will require some degree of compensation, and so some institutional structure is needed to organize providers, screen and classify patients, coordinate referrals, and distribute payments.

A variety of institutional arrangements and funding sources might be envisioned to provide better support for uninsured access to specialist physicians—both now and following insurance reform. The imperfect proposals outlined here may appear excessively facility-centric, but as Willie Sutton famously said about robbing banks, “that’s where the money is.” For reasons both of logic and of political history, the safety net’s principal funding sources are directed to hospitals and CHCs. Therefore, policy levers directed to these institutions offer good options for supporting and encouraging better-structured and more comprehensive safety-net access programs for the uninsured, going forward. But more is needed. To begin to approach truly universal access to care, a tapestry of approaches must be knitted together that embrace both traditional safety-net institutions and innovative approaches to supporting and facilitating specialist treatment of uninsured patients throughout the community.

Acknowledgment

This work was funded by a grant from the Robert Wood Johnson Foundation.

Notes


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52. Hall MA, Hwang W, Jones AS. Model safety-net programs could care for the uninsured at one-half the cost of Medicaid or private insurance. Health Aff (Millwood). 2011 Sep;30(9):1698–707.


By Nadereh Pourat and Len Finocchio

Racial And Ethnic Disparities In Dental Care For Publicly Insured Children

ABSTRACT Poor oral health has important implications for the healthy development of children. Children in Medicaid, especially Latinos and African Americans, experience high rates of tooth decay, yet they visit dentists less often than privately insured children. Even Latino and African American children with private insurance are less likely than white children to visit dentists and have longer intervals between dental visits. Furthermore, Latino and African American children in Medicaid are more likely than white children in Medicaid to have longer intervals between visits. These findings raise concerns about Medicaid’s ability to address disparities in dental care access and, more broadly, in health care.

Lack of dental care, the greatest unmet health need of American children, results in tooth decay. This chronic condition is not resolved unless it is treated. American children miss about 1.6 million school days each year due to dental disease, and low-income children miss more days than children in families with average or high incomes. Tooth decay leads to pain, infection, nutritional problems, sleep deprivation, and poor concentration, and it affects children’s learning and growth. Access to oral health services can reduce tooth decay and lead to improved school attendance, better quality of life, and reduced financial and societal costs.

Despite recent attention to oral health nationally, the prevalence of tooth decay is higher among children in Medicaid than those with private insurance, and fewer children in Medicaid report seeing a dentist. National data indicate that children covered by the Children’s Health Insurance Program (CHIP) and Medicaid were more likely than uninsured children to have had a dental visit in the past year. After the original implementation of CHIP in 1998, children covered by the program had more preventive visits to dentists than before enrollment. Nonetheless, the mean number of visits for privately insured children was higher than for publicly insured children. Evidence on whether Medicaid and CHIP coverage address racial or ethnic disparities is mixed.

National health objectives, as set forth by the U.S. Department of Health and Human Services in Healthy People 2010 and proposed in Healthy People 2020, included ensuring that children have a minimum of one dental visit each year. However, more frequent visits increase the probability of receiving preventive services such as sealants and fluoride treatment soon after new teeth appear, and of early treatment of tooth decay and other problems. Currently, Medicaid, CHIP, and private dental insurance provide coverage for semiannual visits or visits within six months of each other.

Little is known about whether children covered by Medicaid, CHIP, and private insurance differ in the frequency of their dental visits or length of time between visits, or about whether racial or ethnic disparities exist more broadly in Medicaid and CHIP programs than in privately insured populations. To provide more information on these points, we explored differences across racial and ethnic groups and be-
tween children covered by private and public insurance. Specifically, we looked at the length of time between dental visits. We also compared racial and ethnic differences between children with private insurance and those in Medicaid or CHIP.

**Study Data And Methods**

**Source Of Data** Following a conceptual model of access to care developed by Ronald Andersen and Pamela Davidson,11 we sought answers for the following questions: Are there racial or ethnic differences in time since the last dental visit? Are there differences in time since the last visit among children covered by Medicaid, CHIP, and private insurance? Are there racial or ethnic differences in time since the last visit within Medicaid and CHIP?

We used data from the 2005 California Health Interview Survey for our study, to avoid national variations in dental care delivery and financing systems. An added advantage of the California survey is that it provides unique data on minority and ethnic populations with limited English proficiency. These are groups frequently missing from large representative surveys. California’s survey has an overall response rate of 29.6 percent and has been found in multiple studies to be representative of the California population.12

Our sample captured the 10,805 children in the data set who were “dentate,” meaning with teeth.

**Variables** Since we were interested in the length of time between dental visits (the dependent variable in our analysis) and how that differed by racial or ethnic group and type of insurance (the independent variables in our analysis), we began with the survey question that asked parents to report how long it had been since their child last visited a dentist or dental clinic (including dental hygienists and all types of dental specialists).

We divided the responses into the following categories: fewer than six months; six to twelve months; more than one year; and never had a dental visit. (Additional details on our data and methods are available in Online Appendix 1.)

Time since last visit was used as a proxy for frequency of visits, because a direct measure of frequency was not available in the data.

The survey data allowed us to divide respondents into the following racial or ethnic categories: white, Latino, African American, Asian American, and “other.” We combined American Indians, Alaska Natives, and Pacific Islanders into this last group, to achieve sample sizes that would permit statistical analysis.

For dental insurance coverage, we divided respondents into two groups: those who had dental insurance and those who did not. We divided those with dental insurance into four subgroups: those with private insurance and those covered by Medicaid, CHIP, and other public programs, such as through the military.

The California survey did not ask about dental insurance coverage for children with no dental visits. However, we assumed that those covered by Medicaid or CHIP had dental insurance, because dental benefits are mandated by the state’s Medicaid program, Medi-Cal,15 and are provided under the state’s CHIP program, called Healthy Families. For the remaining children without dental visits, we used various techniques to estimate their type of insurance (details about these techniques are available in Online Appendix 1).14

Our statistical model controlled for other correlates of interest, including family income as a percentage of the federal poverty level, parental education, the child’s citizenship, family marital status, family size, the child’s general health status, whether the child had a usual source of medical care, and the parents’ English proficiency. We divided California into seven contiguous clusters of counties and specified whether or not each respondent lived in an urban area. These geographic distinctions were included as proxies for differences in the supply of health care providers, their practice patterns, and other market characteristics.

We categorized children by age, grouped in two-year intervals. Children ages 10–11 were the reference group. Because children age one and younger were not old enough to have had dental visits for more than one year, we excluded them from the multivariate model.

**Analytic Methods** We used logistic regression analysis to examine the likelihood of time since last dental visit for racial and ethnic groups, independent of type of insurance coverage.16,17 The effect of type of coverage on time since last visit was evaluated by comparing the coefficients for types of insurance and testing the significance of the difference in the mean predicted probabilities between groups. All analyses were adjusted for the complex survey design of the California Health Interview Survey using the statistical software STATA 9.2. (Further details are available in Online Appendix 1.)14
Study Results

Exhibit 1 shows characteristics of the sample corresponding to several independent variables, as described above. More specifically, it shows the distribution of children belonging to a particular group (selected characteristics) within a particular category of time since last visit. For example, 44 percent of the children in the sample whose last visit was within six months were white, while 6 percent were African American. Overall, the independent variables had a significant effect on time since last dental visit, with the exception of sex, urban residence, and health status.

Exhibit 2 shows differences across categories of time since last visit for some groups of child-

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**EXHIBIT 1**

Percentage Of Children Ages 0–11 Years With Selected Characteristics, By Time Since Last Dental Visit, Among Children In California, 2005

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (%)</th>
<th>Time since last dental visit (%)</th>
<th></th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Within past 6 months</td>
<td>Within past 6–12 months</td>
<td>More than 12 months ago</td>
<td>Never had a dental visit (%)</td>
</tr>
<tr>
<td><strong>RACE OR ETHNICITY (PREDISPOSING INDICATOR)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>41</td>
<td>44</td>
<td>37</td>
<td>29</td>
<td>37</td>
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<td>African American</td>
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<td>10</td>
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<td>5</td>
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<td><strong>DENTAL INSURANCE COVERAGE (ENABLING INDICATOR)</strong></td>
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<td></td>
</tr>
<tr>
<td>None</td>
<td>18</td>
<td>12</td>
<td>18</td>
<td>26</td>
<td>30</td>
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<tr>
<td>Private</td>
<td>45</td>
<td>54</td>
<td>43</td>
<td>26</td>
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<td>30</td>
<td>27</td>
<td>31</td>
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<td>7</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Other public program</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>OTHER PREDISPOSING, ENABLING, AND NEED INDICATORS</strong></td>
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<tr>
<td>Age (years)**</td>
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<tr>
<td>0–1</td>
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<td>2</td>
<td>1</td>
<td>0</td>
<td>46</td>
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<td>35</td>
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<tr>
<td>Other southern countiesc</td>
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<td>28</td>
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<td>31</td>
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<td>23</td>
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<td>Family income less than 200% of poverty**</td>
<td>44</td>
<td>39</td>
<td>50</td>
<td>63</td>
<td>47</td>
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<td>Has usual source of medical care**</td>
<td>97</td>
<td>98</td>
<td>97</td>
<td>90</td>
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<td>In fair or poor health</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>

**Source:** Authors’ analysis of data from the 2005 California Health Interview Survey. **Notes:** N = 10,805. Chi-square test for length of time since last visit is significantly different for each characteristic as indicated. For variables with only two categories, the test was for differences in the distributions between the two categories indicated; for multivariate variables, a significant result indicates that there is a difference in the distribution between any of the categories. Predisposing refers to existing characteristics that predispose one to service use; enabling refers to economic or other factors that enable or impede use; need refers to health status or disease that requires professional care. All percentages do not sum to 100 because of rounding. *Santa Clara, Alameda, Contra Costa, San Francisco, San Mateo, Sonoma, Solano, Marin, and Napa Counties. †Butte, Shasta, Humboldt, Del Norte, Siskiyou, Lassen, Trinity, Modoc, Mendocino, Lake, Tehama, Glenn, Colusa, Sutter, Yuba, Nevada, Plumas, Sierra, Tuolumne, Calaveras, Amador, Inyo, Mariposa, Mono, and Alpine Counties. ‡Sacramento, Placer, Yolo, and El Dorado Counties. ‡Fresno, Kern, San Joaquin, Stanislaus, Tulare, Merced, Kings, and Madera Counties. §Ventura, Santa Barbara, Santa Cruz, San Luis Obispo, Monterey, and San Benito Counties. ¶Orange, San Diego, San Bernardino, Riverside, and Imperial Counties. **p < 0.05
A dental visit within the previous six months was reported for 53 percent of California children age eleven and younger with teeth; however, 24 percent had never had a dental visit (Exhibit 2). Latino and African American children were more likely than white children either to have never had a visit or to have had visits at longer intervals. In addition, fewer insured children had never visited a dentist, and most had visited one at shorter intervals than uninsured children had.

African American children were 39 percent and Latino children 36 percent more likely to have a longer interval between dental visits compared to white children, controlling for type of dental insurance and other covariates (Exhibit 3). Having any form of dental insurance significantly decreased the odds of having a longer time since the last dental visit, compared to having no dental insurance. However, children with private insurance were more likely than children in Medicaid or CHIP to have had shorter times reported since their last visit. There was no significant difference between children in either of those two public programs.

Children whose family incomes were under 200 percent of the federal poverty level were significantly more likely to have longer times since their last dental visit, while children who were citizens and those who had a usual source of care were significantly less likely. Residents of four California regions (the Sacramento area, San Joaquin Valley, Los Angeles County, and other southern counties) were more likely than residents of the San Francisco Bay Area to have had longer times since their last visit. The same is true of children ages 2–5, compared to children ages 10–11.

Latino and African American children in Medicaid were significantly less likely than white children in Medicaid to have had a dental visit in the past six months (Exhibit 4). No racial or ethnic differences were observed among children in CHIP or with private insurance.

Discussion
These findings confirm the following: (1) Racial or ethnic disparities in time since last dental visit exist in California; (2) there are differences in time since last visit between children covered by Medicaid or CHIP and those with private insurance; and (3) racial or ethnic differences in time since last visit exist within the Medicaid program, to the detriment of Latino and African American children.

Barriers To Care
The racial or ethnic differences in time since the last dental visit, especially within Medicaid, are probably an indication of systematic barriers to dental care that this study did not examine. The small number of participating dentists contributes to racial or ethnic disparities in number of visits within Medicaid.18,19 Racial or ethnic differences between dentists and patients within the California population, as indicated by disproportionately fewer...
Latino (11 percent) and African American (1 percent) dentists, may be another reason.20 Difficulties in making or keeping appointments may also limit the ability of some groups to gain access to dental care.21–23

Public programs and private dental insurance vary in generosity of benefits, amount of copayments, authorization requirements, size of provider networks, and provider reimbursement rates. Medicaid dental benefits for children are comprehensive, although most services are subject to review and prior authorization, and some are restricted to children with specific problems. Many general dentists rarely or never treat children in Medicaid, and even fewer treat younger children in the program.24 Medicaid participation rates among dentists are 50 percent or lower nationally and only about 42 percent in California.25,26 Lower reimbursement rates are a contributing factor.26–28 California’s Medicaid dental program is overwhelmingly fee-for-service, and Medicaid fees are one-half to one-

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RACE OR ETHNICITY (PREDISPOISING INDICATOR)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (reference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>1.39**</td>
<td>1.01–1.92</td>
</tr>
<tr>
<td>Latino</td>
<td>1.36**</td>
<td>1.12–1.92</td>
</tr>
<tr>
<td>Asian American</td>
<td>1.01</td>
<td>0.81–1.27</td>
</tr>
<tr>
<td>Other</td>
<td>1.46**</td>
<td>1.04–2.05</td>
</tr>
</tbody>
</table>

| **DENTAL INSURANCE COVERAGE (ENABLING INDICATOR)** | | |
| None (reference) | | |
| Privately insured | 0.38**** | 0.32–0.46 |
| Medicaid | 0.50**** | 0.39–0.64 |
| Children’s Health Insurance Program | 0.51**** | 0.38–0.70 |
| Other public program | 0.26**** | 0.13–0.50 |

| **OTHER PREDISPOISING, ENABLING, AND NEED INDICATORS** | | |
| Age (years)a | | |
| 2–3 | 4.17**** | 3.35–5.19 |
| 4–5 | 1.33** | 1.07–1.66 |
| 6–7 | 1.01 | 0.78–1.30 |
| 8–9 | 0.97 | 0.77–1.22 |
| 10–11 (reference) | | |
| Female | 0.96 | 0.83–1.10 |
| Single-parent family | 1.09 | 0.89–1.35 |
| 5 or more family members | 0.99 | 0.84–1.16 |
| Parent has 12 or more years of education | 1.19 | 0.94–1.52 |
| Citizen | 0.61** | 0.40–0.92 |
| California region of residenceb | | |
| Bay Area counties (reference) | | |
| Other northern counties | 1.26 | 0.93–1.70 |
| Sacramento Area counties | 1.50** | 1.09–2.06 |
| San Joaquin Valley counties | 1.44**** | 1.12–1.85 |
| Central Coast counties | 0.92 | 0.70–1.22 |
| Los Angeles County | 1.28** | 1.03–1.59 |
| Other southern counties | 1.27** | 1.04–1.56 |
| Urban residence | 0.98 | 0.81–1.20 |
| Parent not fluent English speaker | 1.13 | 0.88–1.46 |
| Family income less than 200% of poverty | 1.38**** | 1.13–1.69 |
| Has a usual source of medical carec | 0.50**** | 0.29–0.84 |
| In fair or poor health | 1.00 | 0.74–1.35 |

**Source** Authors’ analysis of data from the 2005 California Health Interview Survey. **Notes** N = 10,805. Categories of time since last visit were within past 6 months, 6–12 months ago, more than 12 months ago, and never had a visit. The odds ratios come from ordered logistic regression analysis. For explanation of predisposing, enabling, and need indicators, see Notes in Exhibit 1. *Children ages 0–1 are not included in this analysis since they were too young to have visits longer than one year ago. **For counties in each grouping, see Exhibit 1. The impact of usual source of medical care on time since last visit differs by response category. Those with a usual source of medical care are half as likely (OR = 0.50) to have had a visit more than six months ago. Those with last visits less than twelve months ago are approximately one-third (OR = 0.31, not presented in table) as likely to have had visits sooner. The same relationship (OR = 0.31) is found for those who had any visits and those who had none. ***p < 0.001 **p < 0.01 ****p < 0.001
third of the usual and customary fees in California and nationally.\textsuperscript{20,29}

**ROLE OF PREPAID PLANS** The longer time since last dental visit for children in CHIP than for those with private insurance may be partly due to the fact that in California, CHIP is administered through prepaid dental plans. About half of the children in CHIP are enrolled in full-risk capitated plans, although most of these plans pay dentists fee-for-service rather than through the more common practice of a set monthly fee per member. Prepaid plans in California tend to have smaller networks of providers than other plans, which probably makes it difficult for some CHIP enrollees to gain access to care.\textsuperscript{30}

**MEDICAID/CHIP SIMILARITY** The lack of a difference between Medicaid and CHIP in reducing children’s time to last dental visit is noteworthy. CHIP in California is modeled on the state’s employee health benefit plan and covers all major preventive, diagnostic, and restorative services. California CHIP dental plans are required to promote annual preventive visits, and plans comply by sending reminders to families. CHIP plans must also report annually to the state government on two access-related performance measures. Furthermore, the largest plan pays dentists fees that are higher than the Medicaid fee-for-service schedule, although not as high as commercial rates.\textsuperscript{31}

In contrast, the Medicaid dental program is much less structured: Only 4 percent of its enrollees are in capitated dental plans. Medicaid does not monitor or promote appropriate use of care among fee-for-service enrollees. Medicaid also lags behind CHIP in covering a number of important preventive services for children, especially prophylaxis and periodic dental visits.\textsuperscript{20} Despite these differences, children in CHIP and Medicaid had similar times since last dental visit in this study.

**VERY YOUNG CHILDREN** The proportion of very young children with few or no visits is high, approaching 40 percent of children under age three. This may be because parents do not perceive the need for very young children to visit the dentist. The etiology of caries, or tooth decay, and the importance of preventive care is poorly understood among the general public.\textsuperscript{32}

Alternatively, the unavailability of dentists willing to treat the very young may be a barrier for such children.\textsuperscript{33,34} Only about 5 percent of California dentists in private practice are pediatric dentists,\textsuperscript{35} and many general dentists may be insufficiently trained or reluctant to treat pediatric patients.

**IMPACT OF POVERTY** The persistent impact of poverty on dental care despite insurance may be due to a lack of coverage for all dental services or the need to use out-of-network providers. Predictors such as citizenship and having a usual source of medical care may reflect familiarity

---

**EXHIBIT 4**

Predicted Probability Of Time Since Child’s Last Dental Visit, By Race Or Ethnicity, Age, And Dental Insurance Coverage, Among California Children, 2005

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Length of time since last dental visit (%)</th>
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<tr>
<td></td>
<td>Within past 6 months</td>
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<td>Medicaid</td>
<td>75</td>
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<td>CHIP</td>
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<td>Private insurance</td>
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<tr>
<td><strong>AFRICAN AMERICAN</strong></td>
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<td>Medicaid</td>
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<tr>
<td>CHIP</td>
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<tr>
<td>Private insurance</td>
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<tr>
<td><strong>LATINO</strong></td>
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<td>Medicaid</td>
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<tr>
<td>CHIP</td>
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<td>Private insurance</td>
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<td><strong>ASIAN AMERICAN</strong></td>
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<td>Medicaid</td>
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</tr>
<tr>
<td>CHIP</td>
<td>74</td>
</tr>
<tr>
<td>Private insurance</td>
<td>70</td>
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</table>

**SOURCE** Authors’ analysis of data from the 2005 California Health Interview Survey. **NOTES** All percentages do not sum to 100 because of rounding. CHIP is Children’s Health Insurance Program. *Significantly different from whites in Medicaid; p < 0.05. †Significantly different from whites and Asian Americans in Medicaid; p < 0.05.
with the U.S. health care system, the ability to gain access to providers, and continuity of care.\textsuperscript{36,37} Differences by region of residence most likely reflect the uneven distribution of California dentists, with more dentists per capita found in the San Francisco Bay Area.\textsuperscript{35}

**STUDY LIMITATIONS** This study has some limitations attributable to the cross-sectional nature of survey data. Some children with dental visits in the past six months might not have visited the dentist twice a year. Others who reported recent visits might have had their first visit ever, or the first visit in a long time. The total number of dental visits in the past year was not available, nor was a measure of oral health.

Recall bias may also be present, although the self-reported data we used were quite similar to data from dental records used in other studies.\textsuperscript{38} Finally, the data from California may have limited general application because of variations in the structure and provider reimbursement and participation rates of Medicaid and CHIP throughout the country, although children’s Medicaid benefits are uniform nationwide.

**POLICY IMPLICATIONS** Tooth decay is a leading cause of school absences and poor quality of life among publicly insured children. Eliminating the health disparities that these children face can launch them on a trajectory toward positive health and educational outcomes.

▸ **NEED FOR MORE STRATEGIC EFFORTS:** Our results suggest that more strategic efforts are necessary to reduce racial and ethnic disparities in access to dental care among publicly insured children, particularly Latinos and African Americans. One possible step is to increase the participation of dentists in Medicaid and CHIP by increasing reimbursement rates.\textsuperscript{26,29,31} However, such actions are often precluded by state budget shortfalls and are highly unlikely in the current budgetary climate.

▸ **OTHER PRACTITIONERS:** Medicaid reimbursement for the services of dental hygienists in schools and public health venues could also increase children’s access to dental care.\textsuperscript{29} State Medicaid programs could consider offering prepaid dental health plans with broad provider networks and higher reimbursements, coupled with family outreach and annual performance measurement, to improve children’s access to dentists. State legislators could also expand the scopes of practice of dental hygienists and mid-level oral health professionals so that they could work autonomously in areas of need. This mix of strategies could address racial and ethnic disparities in the Medicaid program.

▸ **EXPANDED TRAINING:** There have been modest increases in funds for training pediatric dentists and for training dental students in community health centers. These efforts could be expanded. Projects to increase the ranks of Latino and African American dentists, encourage community practice, and develop cultural competency skills are under way.\textsuperscript{40} The wider implementation of such efforts should be considered.

▸ **FOCUS ON VERY YOUNG CHILDREN:** Strategies to improve dental visits among very young children are also needed. The high rates of very young minority children who have never visited a dentist suggest the need for educating parents about the importance of oral health and preventive care. Medicaid could provide such educational material in its information for new enrollees and could offer incentives for primary care providers to screen very young children. Such screening by pediatricians and other health professionals is already under way in North Carolina and some other states, as a way of reaching children too young to be affected by school-based interventions.\textsuperscript{41,42}


6 Wang H, Norton EC, Rozier RG. Effects of the State Children’s Health
Insurance Program on access to dental care and use of dental services. Health Serv Res. 2007;42(4): 1544–63.
8 Shields AE. Trends in private insurance, Medicaid/State Children’s Health Insurance Program (CHIP), and the health-care safety net: implications for asthma disparities. Chest. 2007; 132(S Suppl):S18S–S30S.
14 The Online Appendix can be accessed by clicking the Online Appendix link in the box to the right of the article online.
15 Medicaid and CHIP children ages 0–11 receive dental benefits regardless of length of their enrollment; with the exception of the 0.05 percent who have emergency Medicaid.
16 The logit2 in STATA was used because the assumption of proportional odds/parallel line could not be met for age and usual source of medical care.
The Oregon Experiment — Effects of Medicaid on..., 2013 WLNR 10775578

5/2/13 New Eng. J. Med. 1713
2013 WLNR 10775578

New England Journal of Medicine
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May 2, 2013
Volume 368; Issue 18

The Oregon Experiment — Effects of Medicaid on Clinical Outcomes

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Despite the imminent expansion of Medicaid coverage for low-income adults, the effects of expanding coverage are unclear. The 2008 Medicaid expansion in Oregon based on lottery drawings from a waiting list provided an opportunity to evaluate these effects.

Approximately 2 years after the lottery, we obtained data from 6387 adults who were randomly selected to be able to apply for Medicaid coverage and 5842 adults who were not selected. Measures included blood-pressure, cholesterol, and glycated hemoglobin levels; screening for depression; medication inventories; and self-reported diagnoses, health status, health care utilization, and out-of-pocket spending for such services. We used the random assignment in the lottery to calculate the effect of Medicaid coverage.

We found no significant effect of Medicaid coverage on the prevalence or diagnosis of hypertension or high cholesterol levels or on the use of medication for these conditions. Medicaid coverage significantly increased the probability of a diagnosis of diabetes and the use of diabetes medication, but we observed no significant effect on average glycated hemoglobin levels or on the percentage of participants with levels of 6.5% or higher. Medicaid coverage decreased the probability of a positive screening for depression (-9.15 percentage points; 95% confidence interval, -16.70 to -1.60; P=0.02), increased the use of many preventive services, and nearly eliminated catastrophic out-of-pocket medical expenditures.

This randomized, controlled study showed that Medicaid coverage generated no significant improvements in measured physical health outcomes in the first 2 years, but it did increase use of health care services, raise rates of diabetes detection and management, lower rates of depression, and reduce financial strain.

In 2008, a lottery was used to select low-income adults for Medicaid expansion in Oregon. In this comparison of persons who were selected and those who were not, Medicaid coverage was associated with a lower rate of depression but no significant improvements in physical health.

In 2008, Oregon initiated a limited expansion of its Medicaid program for low-income adults through a lottery drawing of approximately 30,000 names from a waiting list of almost 90,000 persons. Selected adults won the opportunity to apply for Medicaid and to enroll if they met eligibility requirements. This lottery presented an opportunity to study the effects of Medicaid with the use of random assignment. Earlier, nonrandomized studies sought to investigate the effect of Medicaid on health outcomes in adults with the use of quasi-experimental approaches.(Ref 1)–(Ref 3) Although these approaches can be an improvement over observational designs and often involve larger samples than are feasible with a randomized design, they cannot eliminate confounding factors as effectively as random assignment. We used the random assignment embedded in the Oregon Medicaid lottery to examine the effects of insurance coverage on health care use and health outcomes after approximately 2 years.

Oregon Health Plan Standard is a Medicaid program for low-income, uninsured, able-bodied adults who are not eligible for other public insurance in Oregon (e.g., Medicare for persons 65 years of age or older and for disabled persons; the Children's Health Insurance Program for poor children; or Medicaid for poor children, pregnant women, or other specific, categorically eligible populations). Oregon Health Plan Standard closed to new enrollment in 2004, but the state opened a new waiting list in early 2008 and then conducted eight random lottery drawings from the list between March and September of that year to allocate a limited number of spots.
Methods

Randomization and Intervention
Persons who were selected won the opportunity — for themselves and any household member — to apply for Oregon Health Plan Standard. To be eligible, persons had to be 19 to 64 years of age and Oregon residents who were U.S. citizens or legal immigrants; they had to be ineligible for other public insurance and uninsured for the previous 6 months, with an income that was below 100% of the federal poverty level and assets of less than $2,000. Persons who were randomly selected in the lottery were sent an application. Those who completed it and met the eligibility criteria were enrolled in the plan. Oregon Health Plan Standard provides comprehensive medical benefits, including prescription drugs, with no patient cost-sharing and low monthly premiums ($0 to $20, based on income), mostly through managed-care organizations. The lottery process and Oregon Health Plan Standard are described in more detail elsewhere.(Ref 4)

Data Collection
We used an in-person data-collection protocol to assess a wide variety of outcomes. We limited data collection to the Portland, Oregon, metropolitan area because of logistical constraints. Our study population included 20,745 people: 10,405 selected in the lottery (the lottery winners) and 10,340 not selected (the control group). We conducted interviews between September 2009 and December 2010. The interviews took place an average of 25 months after the lottery began.

Our data-collection protocol included detailed questionnaires on health care, health status, and insurance coverage; an inventory of medications; and performance of anthropometric and blood-pressure measurements. Dried blood spots were also obtained. (Ref 5) Depression was assessed with the use of the eight-question version of the Patient Health Questionnaire (PHQ-8),(Ref 6) and self-reported health-related quality of life was assessed with the use of the Medical Outcomes Study 8-Item Short-Form Survey.(Ref 7) More information on recruitment and field-collection protocols are included in the study (Ref protocol) (available with the full text of this article at NEJM.org); more information on specific outcome measures is provided in the (Ref Supplementary Appendix) (available at NEJM.org). Multiple institutional review boards approved the study, and written informed consent was obtained from all participants.

Statistical Analysis
Virtually all the analyses reported here were prespecified and publicly archived (see the protocol).(Ref 8) Prespecification was designed to minimize issues of data and specification mining and to provide a record of the full set of planned analyses. The results of a few additional post hoc analyses are also presented and are noted as such in Tables 1 through 5. Analyses were performed with the use of Stata software, version 12.(Ref 9)

Adults randomly selected in the lottery were given the option to apply for Medicaid, but not all persons selected by the lottery enrolled in Medicaid (either because they did not apply or because they were deemed ineligible). Lottery selection increased the probability of Medicaid coverage during our study period by 24.1 percentage points (95% confidence interval [CI], 22.3 to 25.9; P<0.001). The subgroup of lottery winners who ultimately enrolled in Medicaid was not comparable to the overall group of persons who did not win the lottery. We therefore used a standard instrumental-variable approach (in which lottery selection was the instrument for Medicaid coverage) to estimate the causal effect of enrollment in Medicaid. Intuitively, since the lottery increased the chance of being enrolled in Medicaid by about 25 percentage points, and we assumed that the lottery affected outcomes only by changing Medicaid enrollment, the effect of being enrolled in Medicaid was simply about 4 times (i.e., 1 divided by 0.25) as high as the effect of being able to apply for Medicaid. This yielded a causal estimate of the effect of insurance coverage.(Ref 10) (See the (Ref Supplementary Appendix) for additional details.)

All analyses were adjusted for the number of household members on the lottery list because selection was random, conditional on household size. Standard errors were clustered according to household to account for intrahousehold correlation. We fitted linear probability models for binary outcomes. As sensitivity checks, we showed that our results were robust when the average marginal effects from logistic regressions for binary outcomes were estimated and when demographic characteristics were included as covariates (see the (Ref Supplementary Appendix)). All analyses were weighted for the sampling and field-collection design; construction of the weights is detailed in the (Ref Supplementary Appendix).
Results

Study Population
Characteristics of the respondents are shown in (Ref Table 1). A total of 12,229 persons in the study sample responded to the survey, for an effective response rate of 73%. There were no significant differences between those selected in the lottery and those not selected with respect to the response rates to either the full survey (0.28 percentage points higher in the group selected in the lottery, P=0.86) or specific survey measures, each of which had a response rate of at least 97% among people who completed any part of the survey. Just over half the participants were women, about a quarter were 50 to 64 years of age (the oldest eligible age group), and about 70% were non-Hispanic white. There were no significant differences between those selected in the lottery and those not selected with respect to these characteristics (F statistic, 0.20; P=0.99) or to the wide variety of prerandomization and interview characteristics examined (see the (Ref Supplementary Appendix)).

Clinical Measures and Health Outcomes
(Ref Table 2) shows estimated effects of Medicaid coverage on blood-pressure, total and high-density lipoprotein (HDL) cholesterol, and glycated hemoglobin levels and depression. In the control group, 30% of the survey respondents had positive screening results for depression, and we detected elevated blood pressure in 16%, a high total cholesterol level in 14%, and a glycated hemoglobin level of 6.5% or more (a diagnostic criterion for diabetes) in 5%. Medicaid coverage did not have a significant effect on measures of blood pressure, cholesterol, or glycated hemoglobin. Further analyses involving two prespecified subgroups — persons 50 to 64 years of age and those who reported receiving a diagnosis of diabetes, hypertension, a high cholesterol level, a heart attack, or congestive heart failure before the lottery (all of which were balanced across the two study groups) — showed similar results (see the (Ref Supplementary Appendix)).

The predicted 10-year risk of cardiovascular events was measured with the use of the Framingham risk score, which estimates risk among persons older than 30 years of age according to sex, age, levels of total cholesterol and HDL cholesterol, blood pressure and use or nonuse of blood-pressure medication, status with respect to diabetes, and smoking status, with the predicted risk of a cardiovascular event within 10 years ranging from less than 1% to 30%.(Ref 11) The 10-year predicted risk did not change significantly with Medicaid coverage (-0.21 percentage points; 95% CI, -1.56 to 1.15; P=0.76).

We investigated whether Medicaid coverage affected the diagnosis of and use of medication for hypertension, hypercholesterolemia, or diabetes. (Ref Table 2) shows diagnoses after the lottery and current medication use. We found no effect of Medicaid coverage on diagnoses after the lottery or on the use of medication for blood-pressure and high cholesterol levels. We did, however, find a greater probability of receiving a diagnosis of diabetes (3.83 percentage points; 95% CI, 1.93 to 5.73; P=0.001) and using medications for diabetes (5.43 percentage points; 95% CI, 1.39 to 9.48; P=0.008). These are substantial increases from the mean rates of diagnosis and medication use in the control group (1.1% and 6.4%, respectively).

A positive result on screening for depression was defined as a score of 10 or more on the PHQ-8 (which ranges from 0 to 24, with higher scores indicating more symptoms of depression). Medicaid coverage resulted in an absolute decrease in the rate of depression of 9.15 percentage points (95% CI, -16.7 to -1.60; P=0.02), representing a relative reduction of 30%. Although there was no significant increase in the use of medication for depression, Medicaid coverage led to an absolute increase in the probability of receiving a diagnosis of depression after the lottery of 3.81 percentage points (95% CI, 0.15 to 7.46; P=0.04), representing a relative increase of about 80%.

Health-Related Quality of Life and Happiness
(Ref Table 3) shows the effects of Medicaid coverage on health-related quality of life and level of happiness. Medicaid coverage led to an increase in the proportion of people who reported that their health was the same or better as compared with their health 1 year previously (7.84 percentage points; 95% CI, 1.45 to 14.23; P=0.02). The physical-component and mental-component scores of the health-related quality of life measure are based on different weighted combinations of the eight-question battery; each ranges from 0 to 100, with higher scores corresponding to better health-related quality of life. Medicaid coverage led to an increase of 1.95 points (95% CI, 0.03 to 3.88; P=0.05) in the average score on the mental component; the magnitude
The use of oral medication for diabetes reduces the glycated hemoglobin level by an average of 1 percentage point within as short a time frame. However, the increase in glycated hemoglobin levels, the point estimate of the decrease we observed is consistent with that which would be seen from such a reduction in the prevalence of hypertension. Moreover, although we did not find a significant change in glycated hemoglobin levels, the estimate of the decrease we observed is consistent with that which would be seen from changes in self-reported health measures. The 95% confidence intervals for many of the estimates of effects were wide enough to include changes that would be considered clinically significant. The improvements appear to be specific to depression and mental health measures; Medicaid coverage led to an increase in self-reported happiness, which is arguably a more general measure of overall subjective well-being.

Discussion

This study was based on more than 12,000 in-person interviews conducted approximately 2 years after a lottery that randomly assigned access to Medicaid for low-income, able-bodied, uninsured adults—a group that comprises the majority of persons who are newly eligible for Medicaid under the 2014 expansion. The results confirm that Medicaid coverage increased overall health care utilization, improved self-reported health, and reduced financial strain; these findings are consistent with previously published results based on mail surveys conducted approximately 1 year after the lottery. With these new data, we found that increased health care utilization observed at 1 year persisted, and we present new results on the effects of Medicaid coverage on objectively measured physical health, depression, condition-specific treatments, and other outcomes of interest.

Medicaid coverage had no significant effect on the prevalence or diagnosis of hypertension or high cholesterol levels or on the use of medication for these conditions. It increased the probability of a diagnosis of diabetes and the use of medication for diabetes, but it had no significant effect on the prevalence of measured glycated hemoglobin levels of 6.5% or higher. Medicaid coverage led to a substantial reduction in the risk of a positive screening result for depression. This pattern of findings with respect to clinically measured health—a positive effect in mental health but not in physical health—is mirrored in the self-reported health measures, with improvements concentrated in mental rather than physical health. The improvements appear to be specific to depression and mental health measures; Medicaid coverage did not appear to lead to an increase in self-reported happiness, which is arguably a more general measure of overall subjective well-being.

Hypertension, high cholesterol levels, diabetes, and depression are only a subgroup of the set of health outcomes potentially affected by Medicaid coverage. We chose these conditions because they are important contributors to morbidity and mortality, feasible to measure, prevalent in the low-income population in our study, and plausibly modifiable by effective treatment within a 2-year time frame. Nonetheless, our power to detect changes in health was limited by the relatively small numbers of patients with these conditions; indeed, the only condition in which we detected improvements was depression, which was by far the most prevalent of the four conditions examined. The 95% confidence intervals for many of the estimates of effects on individual physical health measures were wide enough to include changes that would be considered clinically significant—such as a 7.16-percentage-point reduction in the prevalence of hypertension. Moreover, although we did not find a significant change in glycated hemoglobin levels, the point estimate of the decrease we observed is consistent with that which would be expected on the basis of our estimated increase in the use of medication for diabetes. The clinical-trial literature indicates that the use of oral medication for diabetes reduces the glycated hemoglobin level by an average of 1 percentage point within as short a time frame.
a time as 6 months. (Ref 15) This estimate from the clinical literature suggests that the 5.4-percentage-point increase in the use of medication for diabetes in our cohort would decrease the average glycated hemoglobin level in the study population by 0.05 percentage points, which is well within our 95% confidence interval. Beyond issues of power, the effects of Medicaid coverage may be limited by the multiple sources of slippage in the connection between insurance coverage and observable improvements in our health metrics; these potential sources of slippage include access to care, diagnosis of underlying conditions, prescription of appropriate medications, compliance with recommendations, and effectiveness of treatment in improving health. (Ref 17)

Anticipating limitations in statistical power, we prespecified analyses of subgroups in which effects might be stronger, including the near-elderly and persons who reported having received a diagnosis of diabetes, hypertension, a high cholesterol level, a heart attack, or congestive heart failure before the lottery. We did not find significant changes in any of these subgroups. To try to improve statistical power, we used the Framingham risk score as a summary measure. This allowed us to reject a decrease of more than 20% in the predicted 10-year cardiovascular risk or a decrease of more than 10% in predicted risk among the participants with high-risk diagnoses before the lottery. Our results were thus consistent with at best limited improvements in these particular dimensions of physical health over this time period, in contrast with the substantial improvement in mental health.

Although changes in health status are of great interest, they are not the only important potential benefit of expanded health insurance coverage. Health insurance is a financial product that is aimed at providing financial security by protecting people from catastrophic health care expenses if they become injured or sick (and ensuring that the providers who see them are paid). In our study, Medicaid coverage almost completely eliminated catastrophic out-of-pocket medical expenditures.

Our estimates of the effect of Medicaid coverage on health, health care utilization, and financial strain apply to able-bodied, uninsured adults with incomes below 100% of the federal poverty level who express interest in insurance coverage — a population of considerable interest for health care policy, given the planned expansion of Medicaid. The Patient Protection and Affordable Care Act of 2010 allows states to extend Medicaid eligibility to all adults with incomes of up to 138% of the federal poverty level. However, there are several important limits to the generalizability of our findings. First, the low-income uninsured population in Oregon differs from the overall population in the United States in some respects, such as the proportions of persons who are members of racial and ethnic minority groups. Second, our estimates speak to the effect of Medicaid coverage on the subgroup of people who signed up for the lottery and for whom winning the lottery affected their coverage status; in the (Ref Supplementary Appendix) we provide some additional details on the characteristics of this group. Medicaid coverage may have different effects for persons who seek insurance through the lottery than for the general population affected by coverage mandates. For example, persons who signed up for the lottery may have expected a greater health benefit from insurance coverage than those who did not sign up. Of course, most estimates suggest imperfect (and selective) Medicaid take-up rates even under mandates. (Ref 18) Third, the newly insured participants in our study constituted a small share of all uninsured Oregon residents, limiting the system-level effects that insuring them might generate, such as strains on provider capacity or investment in infrastructure. Fourth, we examined outcomes in people who gained an average of 17 months of coverage (those insured through the lottery were not necessarily covered for the entire study period); the effects of insurance in the longer run may differ.

Despite these limitations, our study provides evidence of the effects of expanding Medicaid to low-income adults on the basis of a randomized design, which is rarely available in the evaluation of social insurance programs. We found that insurance led to increased access to and utilization of health care, substantial improvements in mental health, and reductions in financial strain, but we did not observe reductions in measured blood-pressure, cholesterol, or glycated hemoglobin levels.

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Footnote:

The findings and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of the funders.

Supported by grants from the Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services; the California HealthCare Foundation; the John D. and Catherine T. MacArthur Foundation; the National Institute on Aging (P30AG012810, RC2AGO36631, and R01AG0345151); the Robert Wood Johnson Foundation; the Alfred P. Sloan Foundation; the Smith Richardson Foundation; and the Social Security Administration (5 RRC 08098400-03-00, to the National Bureau of Economic Research as part of the Retirement Research Consortium of the Social Security Administration); and by the Centers for Medicare and Medicaid Services.

(Ref Disclosure forms) provided by the authors are available with the full text of this article at NEJM.org.

We thank Chris Afendulis, Josh Angrist, Jack Fowler, Guido Imbens, Larry Katz, Jeff Kling, Ken Lang, Stacy Lindau, Jens Ludwig, Thomas McDade, Ben Olken, and the team from the National Center for Health Statistics for helpful comments and advice; Brandi Coates, Sara Kwastnick, Zirui Song, Nivedhitha Subramanian, and Annetta Zhou for research assistance; our field staff for participant recruitment and data collection; and the numerous Oregon state employees who helped us acquire necessary data and answered our many questions about the administration of state programs.

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Figures and Tables:

Table 1. Characteristics of the 12,229 Survey Respondents.

Table 2. Mean Values and Absolute Change in **Clinical Measures and Health Outcomes** with **Medicaid** Coverage.

Table 3. Mean Values and Absolute Change in Health-Related Quality of Life and Happiness with **Medicaid** Coverage.

Table 4. Mean Values and Absolute Change in Financial Hardship with **Medicaid** Coverage.

Table 5. Mean Values and Absolute Change in Health Care Utilization and Spending, Preventive Care, Access to and Quality of Care, and Smoking and Obesity with **Medicaid** Coverage.

---- Index References ----

Company: OSCIENT PHARMACEUTICALS CORP; ROCKRIDGE CAPITAL CORP; TAUBMAN CENTERS INC
The Oregon Experiment — Effects of Medicaid on..., 2013 WLNR 10775578

News Subject: (Health & Wellness (1HE60); Health & Family (1HE30); Cholesterol & Hyperlipidemia (1CH66); Obesity & Weight Control (1OB69))

Industry: (Health Insurance (1HE18); Heart Disease (1HE92); Healthcare (1HE06); Healthcare Regulatory (1HE04); Financial Services (1FI37); Insurance (1IN97); U.S. National Healthcare Reform (1US09))

Region: (U.S. New England Region (1NE37); Americas (1AM92); Oregon (1OR01); U.S. West Region (1WE46); North America (1NO39); USA (1US73); Massachusetts (1MA15))

Language: EN

Other Indexing: (STATACORP) (Jeff Kling; Ken Langa; Stacy Lindau; Nivedhitha Subramanian; Josh Angrist; Zirui Song; Ann Intern Med; Jack Fowler; Ben Olken; Thomas McDade; Guido Imbens; Brandi Coates; Annetta Zhou; Chris Afendulis; Sara Kwasnick; Larry Katz; Jens Ludwig)

Word Count: 4191
To make them more responsive to their community’s needs, federally qualified health centers (FQHCs) are required to have a governing board comprising at least 51 percent consumers. However, the extent to which consumer board members actually resemble the typical FQHC patient has not been assessed, which according to the political science literature on representation may influence the board’s ability to represent the community. This mixed-methods study uses four years of data from the Health Resources and Services Administration, combined with Uniform Data System, Bureau of Labor Statistics, and Area Resource File data, to describe and identify factors associated with the composition of FQHC governing boards. Board members are classified into one of three groups: nonconsumers, nonrepresentative consumers (who do not resemble the typical FQHC patient), and representative consumers (who resemble the typical FQHC patient). The analysis finds that a minority of board members are representative consumers, and telephone interviews with a stratified random sample of thirty FQHC board members confirmed the existence of significant socioeconomic gaps between consumer board members and FQHC patients. This may make FQHCs less responsive to the needs of the predominantly low-income communities they serve.
quality, cost-effective health care is well documented (Proser 2005). Recognizing this, Congress made a significant investment in FQHCs, permanently authorizing the program and dedicating $11 billion in a new FQHC trust fund as part of the Patient Protection and Affordable Care Act (Hall 2011).

A defining characteristic of FQHCs is their consumer governance mandate, which requires that at least 51 percent of the governing board must consist of consumers (i.e., patients) of the center. Furthermore, the board as a whole is required to “represent the individuals being served by the center” (Section 330 of the Public Health Service Act, 42 U.S.C. § 254b [1996]). According to the Health Resources and Services Administration (HRSA 1998a: 22), which administers the FQHC program:

Since the intent is for consumer board members to give substantive input into the health center’s strategic direction and policy, these members should utilize the health center as their principal source of primary health care. . . . [In addition,] the board should be comprised of members with a broad range of skills and expertise. Finance, legal affairs, business, health, managed care, social services, labor relations and government are some examples of the areas of expertise needed by the board to fulfill its responsibilities.

The requirement for FQHCs to have consumer-majority governing boards originated from the participatory democracy of the civil rights movement and a strong sentiment of “anti-professionalism” that sought to empower the poor (Boone 1972). More recently, consumer governance has been heralded as a way to make FQHCs more responsive to their community’s needs by giving a representative voice to a group of patients who are otherwise frequently underrepresented (Phillips 1998). In this view, the extent to which representatives share salient characteristics with those they represent (descriptive representation) is positively associated with the extent to which representatives advocate for the interests of those they represent (substantive representation) (Pitkin 1967). Indeed, the positive relationship between descriptive and substantive representation has been well established (Scherer and Curry 2010; Preuhs 2007; Wängnerud 2009; Herrick 2009). Descriptive representation may especially improve substantive representation of the interests of disenfranchised and underrepresented groups in cases where disadvantaged groups do not trust those in power and where the views of the disadvantaged groups are not well known to persons outside the group (Mansbridge 1999; Dovi 2003).

However, no formal process is mandated for the identification and
selection of consumer board members, and little is known about who actually governs these increasingly important health care organizations (Hollister 1974; Morone 1998; Peterson 1970). Prior studies have found consumer governance to be fraught with implementation challenges, including dominance by social elites (Robins and Blackburn 1974), low levels of consumer participation (Windle, Bass, and Taube 1974), and disparities in working knowledge between consumers and nonconsumers (Paap 1978). More recent evidence suggests that FQHC board chairs and executive directors may undermine the intent of the consumer governance requirement by identifying potential board members for their expertise and encouraging them to become consumers (Bracken 2007).

Despite the challenges inherent in achieving descriptive representation (Chesney 1982; Cross 2002; Lipsky and Lounds 1976) and the fact that disadvantaged groups lack the resources necessary to participate directly or engage their representatives to act on their behalf (Berinsky 2002; Verba, Schlozman, and Brady 1995), calls for direct citizen participation in health care persist (Morone and Kilbreth 2003). Further complicating matters is that while consumer governance may make organizations more responsive to patient demands, the potential technical expertise gap between consumers and nonconsumers may have important implications for organizational performance (LeRoux 2009). FQHC governing boards are required to simultaneously have a consumer majority and the technical and professional expertise required for effective governance. Given a limited number of board seats, striking this balance may prove a challenge. As John Gaventa (1998: 56) writes, “Mandates for participation from ‘above’ must be linked with pre-existing capacities for participation ‘from below.’” The typical low-income, poorly educated FQHC consumer may be best able to identify the community’s needs but is unlikely to possess the technical and/or professional skills required for the complex task of FQHC governance.

In the current study I use mixed methods to describe the composition of FQHC governing boards, assess the extent to which consumer board members are socioeconomically representative of the FQHC patient population, and identify factors that predict variation in the consumer composition of FQHC governing boards. As FQHCs stand poised to play an even larger role in a reformed health care system, answering the decades-old question of who truly governs FQHCs is an important first step to better understanding the function of these important safety net providers. This study also speaks to the potential role of consumers as team members in a modern health care system seeking to provide patient-centered care
(Martin and Finn 2011), improve the cultural competence of health care organizations (Blustein et al. 2011), and allay concerns about government control of decision making (Hsiao et al. 2011).

**Study Data and Methods**

Data on FQHC board members, including consumer status and occupation, are reported in exhibit D of FQHC grant applications, which are filed annually with HRSA. These data for the years 2003–2006 were obtained from HRSA in hard copy after filing a request under the Freedom of Information Act. A second request was filed to obtain a more complete set of records. Using a high-volume scanner in conjunction with specialized Able2Extract data extraction software (Investintech.com 2011), documents were converted into an electronic format and merged with FQHC-level data from HRSA’s Uniform Data System (UDS) and community-level data from the Area Resource File for subsequent analysis in Stata 10 (StataCorp 2007).

Using the UDS data, some FQHCs were excluded from this study using a set of criteria designed to limit the analysis to fully operational, federally funded FQHCs. At a minimum, such centers should have at least one full-time medical provider, at least one full-time administrative staff person, and at least five thousand annual patient encounters (Wells, Punekar, and Vasey 2009). FQHCs not meeting these criteria were excluded. FQHCs not only consist of community health centers (CHCs) but also include grantees of the migrant health, health care for the homeless, public housing, and school-based health center programs. These entities are eligible for a waiver of the consumer governance requirement if, and only if, they do not also receive funding from the CHC program (HRSA 1998b). Therefore, to ensure that all FQHCs in the sample were subject to the consumer governance requirement, non-CHC grantees were omitted from the sample. Finally, 164 FQHCs located in US commonwealths and territories were excluded because of the likelihood that these centers are substantively different from FQHCs located in the fifty United States or the District of Columbia.

Using these criteria, 615 FQHC-year observations were excluded from the study. This left a starting sample of 3,143 FQHC years representing 824 unique FQHCs during the four years of the study. However, as shown in table 1, the sample was limited to the 71.4 percent of total FQHC-year observations in the UDS data for which corresponding grant application data were made available via the Freedom of Information Act request.
Because FQHCs for which data are available may differ from FQHCs for which data are not available, a binary variable was created to indicate observations with missing FQHC grant data. A logistic regression of this variable on a set of variables in the UDS for all 3,143 FQHCs in the sample indicated that FQHCs with and without missing data did not differ with respect to location, caseload, patient demographics, acuity, or payer mix.

On the grant applications, board member consumer status was recorded as a dichotomous variable, while board member occupation was reported in a free-response format. To standardize responses, the occupation data were coded to conform to Standard Occupational Classification (SOC) codes used by the US Bureau of Labor Statistics (BLS) (2010a). These codes uniquely identify occupations and allow them to be linked to data on average annual income, which are also available from the BLS (2010b). A table indicating how SOC codes were applied to the board member occupation data is available as an appendix.

After board members were assigned an SOC code, their occupations were dichotomized by income. Occupations with a mean annual income greater than 200 percent of the federal poverty level for a family of four in 2009 ($44,100) were considered high status, while occupations with incomes below this level were considered low status. This cutoff was selected to correspond with the socioeconomic status of the majority (> 90 percent) of FQHC patients. An exception was made for social workers, whose average income would normally assign them to the low-status category, because their field requires extensive training beyond college. In this way, based on their self-reported occupation and BLS data, each board member was assigned to a high- or low-status occupation. Then, because a low-status board member is more descriptively representative of the typical FQHC patient than is a high-status board member, the

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of FQHC Grantees</th>
<th>Number Excluded</th>
<th>Total FQHC Sample</th>
<th>Total Number of Grant Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>890</td>
<td>154</td>
<td>736</td>
<td>397 (54%)</td>
</tr>
<tr>
<td>2004</td>
<td>914</td>
<td>146</td>
<td>768</td>
<td>297 (39%)</td>
</tr>
<tr>
<td>2005</td>
<td>952</td>
<td>155</td>
<td>797</td>
<td>767 (96%)</td>
</tr>
<tr>
<td>2006</td>
<td>1,002</td>
<td>160</td>
<td>842</td>
<td>784 (93%)</td>
</tr>
<tr>
<td>Total</td>
<td>3,758</td>
<td>615</td>
<td>3,143</td>
<td>2,245 (71.4%)</td>
</tr>
</tbody>
</table>

*Source: Health Resources and Services Administration; HRSA Uniform Data System*
dichotomous consumer variable reported on FQHC grant applications was recoded categorically to include nonconsumers, representative consumers, and nonrepresentative consumers, as shown in figure 1.

There were 293 cases where occupation was missing and 27 cases where occupation could not be clearly coded using the SOC codes. All these cases ($N = 320$) were coded using an imputed value of “other” and treated as low-status occupations. This was done to code conservatively, making it more likely to assign someone of high socioeconomic status to a low-status SOC than to assign someone of low socioeconomic status to a high-status SOC. It would therefore be more probable that we would overestimate rather than underestimate the proportion of representative consumers, ensuring that results may be biased toward the null but not overstated.

After examining the descriptive statistics to better understand board composition, a pair of ordinary least squares regression models was estimated to predict board composition as a function of various FQHC- and community-level factors. The first model predicted the proportion of representative consumers on the board, while the second model predicted the proportion of nonrepresentative consumers on the board. Both models were estimated using FQHC-level clustered standard errors to account for repeated observations of FQHCs over time. While a model with FQHC
fixed effects would be ideal, these data represent a short panel with more variation in board composition between FQHCs than within FQHCs over time.

In addition to the quantitative analysis described above, semistructured telephone interviews were conducted with thirty FQHC board members to assess their perception of the degree of descriptive representation on the board and provide additional context for interpreting the quantitative results. Using UDS data, all FQHCs were stratified into one of four cells representing all possible combinations of service provision (high versus low) and financial performance (high versus low). Using a random number generator, an FQHC was selected in each cell, and the CEO was contacted by e-mail and asked to identify two board members (one consumer and one nonconsumer, if possible) for interviews. If an FQHC declined to participate, it was replaced with another FQHC randomly selected and contacted. A balance of census regions, urban and rural locations, and large and small FQHCs (cutoff of 9,293 users) was sought over time as respondents agreed to participate. Once a quota had been filled, a randomly selected FQHC that would exceed the quota was replaced and another FQHC was randomly selected. This process was continued as needed in each cell until enough FQHCs willing to participate in the study were identified.

Once an FQHC had agreed to participate in the study, the board members were contacted by e-mail or telephone to schedule a mutually convenient time for the interviews. Telephone interviews were conducted and digitally recorded and were kept semistructured through the use of an interview guide containing a mixture of open-ended and fixed-response questions about the extent of consumer governance, its advantages and disadvantages, and the FQHC’s decision-making process. In practice, the interview guide was closely followed, although the question order was sometimes altered as the interview evolved, and not all participants were asked all questions. The interviews generated approximately 23 hours of recorded audio and 363 pages of transcribed data.

All transcripts were reviewed once for accuracy and compared against the original audio file if necessary. Transcripts were reviewed a second time for substance, to increase familiarity with the interview content and better understand the data. In a third review, start codes were applied to the data using ATLAS.ti (2009), with additional codes created as dictated by the data. A 20 percent sample was independently coded by a research assistant as a validity check, with discrepancies resolved by consensus. Then, using ATLAS.ti, the codes were linked to one another in an axial coding process to build a conceptual framework.
Study Results

The mean descriptive statistics for the sample are shown in table 2, with selected variables broken out by year in table 3. During the study period, the average FQHC board had between twelve and thirteen members. Using the four years of data to categorize board members revealed that 30.9 percent of board members were nonconsumers, while 69.1 percent were consumers. However, slightly more than 60 percent of self-reported consumers also self-identified high-status occupations. As a result, 42.6 percent of board members are classified as nonrepresentative consumers (whose socioeconomic status does not resemble the typical FQHC patient), while only 26.5 percent are classified as representative consumers (whose socioeconomic status resembles the typical FQHC patient). By comparison, at least 66 percent of FQHC patients meet the criteria used to identify representative consumers, with income level unknown for an additional 27 percent of patients.

However, there is variation in the composition of governing boards among FQHCs. The distribution of FQHCs by the proportion of representative and nonrepresentative consumers on the board is shown in figure 2. While representative consumers are in the minority on nearly 92 percent of FQHC boards, a small number of FQHCs do have representative consumer majorities. Similarly, nonrepresentative consumers are in the minority on 68 percent of FQHC boards. It is evident that although some FQHCs meet the consumer governance requirement entirely with representative or nonrepresentative consumers, most boards employ a mix of the two. The trend data in table 3 suggest, however, that the consumer board member population is slowly becoming less representative over time.

The results of the regression models appear in table 4. Overall, the regression models explained 10 percent of the variation in the proportion of representative consumers on the board and 25 percent of the variation in the proportion of nonrepresentative consumers on the board. While FQHC size (caseload) was not significantly associated with board composition, board size itself was an important factor. Each additional board member is associated with a decrease of nearly 0.6 percentage points in the composition of nonrepresentative consumers on the board but is not associated with the proportion of representative consumers. Staff composition was also important. Each 10 percentage point increase in the proportion of staff composed of physicians is associated with a decrease of 4.9 percentage points in the proportion of representative consumers and
### Table 2  Summary Statistics ($N = 2,245$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board size</td>
<td>12.48</td>
<td>3.11</td>
</tr>
<tr>
<td>% in urban location</td>
<td>46.15</td>
<td>49.86</td>
</tr>
<tr>
<td>Average users per delivery site</td>
<td>3609.26</td>
<td>2743.40</td>
</tr>
<tr>
<td>Physicians as % of staff</td>
<td>8.15</td>
<td>3.62</td>
</tr>
<tr>
<td>Physicians per 1,000 population</td>
<td>1.76</td>
<td>1.14</td>
</tr>
<tr>
<td>Nonprofits per 100,000 population</td>
<td>10.12</td>
<td>13.22</td>
</tr>
<tr>
<td>Grantee Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% migrant</td>
<td>13.32</td>
<td>33.99</td>
</tr>
<tr>
<td>% homeless</td>
<td>11.27</td>
<td>31.63</td>
</tr>
<tr>
<td>% school-based</td>
<td>7.66</td>
<td>26.60</td>
</tr>
<tr>
<td>% public housing</td>
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<td>17.26</td>
</tr>
<tr>
<td>% community health</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Census Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Midwest</td>
<td>20.13</td>
<td>40.11</td>
</tr>
<tr>
<td>% Northeast</td>
<td>17.99</td>
<td>38.42</td>
</tr>
<tr>
<td>% South</td>
<td>36.26</td>
<td>48.09</td>
</tr>
<tr>
<td>% West</td>
<td>25.61</td>
<td>43.66</td>
</tr>
<tr>
<td>% of patients male</td>
<td>40.51</td>
<td>5.49</td>
</tr>
<tr>
<td>% of patients in poverty</td>
<td>48.59</td>
<td>23.23</td>
</tr>
<tr>
<td>% of patients nonwhite</td>
<td>55.42</td>
<td>32.26</td>
</tr>
<tr>
<td>% of patients with chronic disease</td>
<td>49.66</td>
<td>27.63</td>
</tr>
<tr>
<td>Insurance Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% uninsured</td>
<td>38.77</td>
<td>17.41</td>
</tr>
<tr>
<td>% Medicaid</td>
<td>31.87</td>
<td>14.33</td>
</tr>
<tr>
<td>% Medicare</td>
<td>9.01</td>
<td>6.01</td>
</tr>
<tr>
<td>% other public</td>
<td>1.84</td>
<td>3.97</td>
</tr>
<tr>
<td>% private</td>
<td>18.51</td>
<td>13.81</td>
</tr>
<tr>
<td>% of population male</td>
<td>49.30</td>
<td>1.87</td>
</tr>
<tr>
<td>% of population in poverty</td>
<td>15.84</td>
<td>5.94</td>
</tr>
<tr>
<td>% of population uninsured</td>
<td>15.45</td>
<td>4.93</td>
</tr>
<tr>
<td>% of population unemployed</td>
<td>5.88</td>
<td>2.25</td>
</tr>
<tr>
<td>% of population nonwhite</td>
<td>21.71</td>
<td>18.97</td>
</tr>
<tr>
<td>% of population in Medicare</td>
<td>15.01</td>
<td>3.96</td>
</tr>
</tbody>
</table>

*Source: Health Resources and Services Administration; HRSA Uniform Data System; Area Resource File*
an increase of 5.6 percentage points in the proportion of nonrepresentative consumers on the board.

Location is one of the most important determinants of FQHC board composition. FQHCs in urban locations have nearly 3 percentage points fewer nonrepresentative consumers on the board, though urbanicity is not associated with the proportion of representative consumers. In addition, compared with FQHCs in the Northeast, FQHCs in the South and West census regions have a lower proportion of nonrepresentative consumers and a higher proportion of representative consumers on the board. Perhaps also related to location, FQHCs with a migrant health center grant have on average 8.6 percentage points fewer nonrepresentative consumers and 6.4 percentage points more representative consumers on the board.

Case mix by gender, poverty level, and race were not significant predictors of board composition. However, insurance status was an important predictor of the proportion of nonrepresentative consumers on the board. FQHCs with a greater proportion of uninsured and/or Medicaid patients tended to have lower proportions of nonrepresentative consumers, while FQHCs with a greater proportion of Medicare patients tended to have higher proportions of nonrepresentative consumers. Insurance status did not affect the proportion of descriptive consumers. The year variables indicate that the proportion of nonrepresentative consumers on the board increased by more than 3 percentage points between 2003 and 2006. Conversely, while there was a decreasing trend in the proportion of representative consumers, it was not statistically significant. None of the community-level population demographics were statistically significant in either model; however, each additional nonprofit per 100,000 population

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Mean Descriptive Statistics for Select Variables by Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>2003</td>
</tr>
<tr>
<td>Board size</td>
<td>12.60</td>
</tr>
<tr>
<td>% nonconsumers</td>
<td>31.43</td>
</tr>
<tr>
<td>% representative consumers</td>
<td>27.77</td>
</tr>
<tr>
<td>% nonrepresentative consumers</td>
<td>40.80</td>
</tr>
<tr>
<td>% of patients &lt; 200% FPL</td>
<td>66.66</td>
</tr>
<tr>
<td>% of patients &gt; 201% FPL</td>
<td>9.21</td>
</tr>
<tr>
<td>% of patients FPL unknown</td>
<td>24.13</td>
</tr>
<tr>
<td>Observations (N)</td>
<td>397</td>
</tr>
</tbody>
</table>

Source: Health Resources and Services Administration; HRSA Uniform Data System
Note: FPL = federal poverty level
is associated with a 0.21 percentage point increase in the proportion of nonrepresentative consumers on the board.

The composition of FQHC governing boards identified in the quantitative analysis was generally confirmed by the qualitative interviews. All four US census regions were represented, with board members from FQHCs in Alaska, California, Florida, Illinois, Kentucky, Maine, Maryland, Massachusetts, Michigan, New York, Oklahoma, South Carolina, Virginia, and Wisconsin participating in the interviews. The respondents consisted of twelve men and eighteen women ranging in age from twenty-eight to seventy-five, with a mean age of fifty-six years. The majority were white \( (n = 16) \) or black \( (n = 12) \). Six of the respondents were board chairs, three were vice chairs, seven were secretaries, one was treasurer, and the remaining thirteen did not hold office.

The interview respondents themselves were not descriptively representative of the typical FQHC patient. Participants were highly educated, with twenty-nine of the thirty completing at least some college and eleven possessing graduate degrees. They were also generally high income. Nearly 60 percent reported an annual household income greater than $80,000, while only five individuals reported an annual household income below $40,000.
Table 4  Results of Linear Regression Models Predicting Board Composition ($N = 2,245$)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Representative Consumers</td>
<td>% Nonrepresentative Consumers</td>
</tr>
<tr>
<td>Board size</td>
<td>0.15</td>
<td>-0.59**</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.17)</td>
</tr>
<tr>
<td>Urban location</td>
<td>0.69</td>
<td>-2.74**</td>
</tr>
<tr>
<td></td>
<td>(0.93)</td>
<td>(1.05)</td>
</tr>
<tr>
<td>Average users per delivery site (in thousands)</td>
<td>-0.14</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(0.22)</td>
</tr>
<tr>
<td>Physicians as % of staff</td>
<td>-0.49**</td>
<td>0.56***</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>Physicians per 1,000 population</td>
<td>-0.96</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>(0.58)</td>
<td>(0.71)</td>
</tr>
<tr>
<td>Nonprofits per 100,000 population</td>
<td>-0.01</td>
<td>0.21**</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Grantee Type (CHC omitted)</td>
<td>6.43***</td>
<td>-8.56***</td>
</tr>
<tr>
<td>Migrant</td>
<td>1.67</td>
<td>(1.79)</td>
</tr>
<tr>
<td>Homeless</td>
<td>1.50</td>
<td>-3.44</td>
</tr>
<tr>
<td></td>
<td>(1.63)</td>
<td>(1.83)</td>
</tr>
<tr>
<td>School-based</td>
<td>0.88</td>
<td>-1.22</td>
</tr>
<tr>
<td></td>
<td>(1.75)</td>
<td>(2.01)</td>
</tr>
<tr>
<td>Public housing</td>
<td>0.65</td>
<td>1.27</td>
</tr>
<tr>
<td></td>
<td>(2.71)</td>
<td>(3.36)</td>
</tr>
<tr>
<td>Census Region (Northeast omitted)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwest</td>
<td>1.69</td>
<td>-3.50</td>
</tr>
<tr>
<td></td>
<td>(1.45)</td>
<td>(1.91)</td>
</tr>
<tr>
<td>South</td>
<td>3.31*</td>
<td>-4.27*</td>
</tr>
<tr>
<td></td>
<td>(1.62)</td>
<td>(2.01)</td>
</tr>
<tr>
<td>West</td>
<td>4.90*</td>
<td>-6.25**</td>
</tr>
<tr>
<td></td>
<td>(1.94)</td>
<td>(2.27)</td>
</tr>
<tr>
<td>% of patients male</td>
<td>0.16</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>% of patients in poverty</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>% of patients nonwhite</td>
<td>-0.02</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>% of patients with chronic disease</td>
<td>0.04</td>
<td>-0.05*</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Insurance Status (private omitted)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% uninsured</td>
<td>0.07</td>
<td>-0.25***</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
</tr>
</tbody>
</table>
Most respondents (80 percent) identified as FQHC patients. However, two of these patients indicated that they did not consider the FQHC to be their usual source of care, and three additional patients reported using dental services only. In essence, nineteen board members (63 percent) were consumers who considered the FQHC to be their usual source of
primary care, while eleven board members (37 percent) were either not consumers or consumers who did not meet HRSA’s definition of a consumer. A comparison of consumer and board member tenure revealed that 25 percent of the self-identified consumers interviewed had joined the board prior to becoming patients.

When asked to assess the level of representativeness on their board, there was near-universal recognition of a socioeconomic gap between the board and the patients. Most common were responses such as this one from a board member at an FQHC in New York City, who felt that the board members are not representative of the patients served in a number of ways:

Basically, most of our board is full time working professionals who have private health insurance and who use various private sources of care. Our patients for the most part are low income people of color who live in inner-city neighborhoods. . . . On our board, there’s a big class, race, socioeconomic, educational gulf between people like myself and most of the patients. . . . I’m not really a patient the way the community health center governance requirements were set up. Now, not everybody has to be a patient, you want to have some people like me, but there should be more patient-patients, patients with a capital P as opposed to patients in quotation marks.

Similarly representative responses came from a board member at an FQHC in Baltimore and another at an FQHC in rural Michigan, respectively, who stressed differences in income and education between the board and patients:

I think that we’re probably not quite as representative because our board is pretty well educated even though we’re lower to middle income. We’re probably on a little better heel than most of the clients that we see. . . . I suspect that most of our client base is from the lower economic strata and I think our trustee-based clients [are] probably middle-income, moderate-income. (Baltimore FQHC)

I think the new breed in particular tends to be a socioeconomic cut or cuts above the typical patient. . . . You have to understand a financial statement or a legal document. You need to have a little education. (Michigan FQHC)

A few respondents, such as this one from an FQHC in rural Alaska, described their boards as being at least somewhat representative of the patients served but still noted a socioeconomic divide:
I think we’re relatively representative. The one thing that perhaps we may not be is that . . . most of those of us on the board are in an upper income bracket for the area. . . . Many of the people on the other end of our sliding scale are up here in subsistence lifestyles and/or seasonal workers, sometimes unemployed. . . . We’re not exactly representative of the lower end of the scale.

While some respondents indicated that their board did a good job of representing the racial, gender, and geographic diversity of their patients, none indicated that their board was very representative of the patients served, primarily citing substantial socioeconomic differences between patients and board members.

**Discussion**

Despite the requirement that a majority of board members must be consumers, the results of this study suggest that descriptive representation is lacking on most FQHC governing boards. While nearly two-thirds of board members are consumers, only about one-fourth are representative of typical FQHC patients. What is more, the method used to categorize consumer board members is likely to have overestimated the degree of descriptive representation. It is reasonable to assume that the true proportion of representative consumer board members may be closer to one in five. By contrast, the majority of consumer board members are not representative. While the board members in this group do report being FQHC patients, they also belong to a high-status group that includes physicians, lawyers, and other professionals.

The predictive modeling suggests that FQHCs in urban areas of the northeastern United States tend to have lower levels of consumer governance overall, especially as board size increases. Among consumers, certain factors seem to be associated with the representative-nonrepresentative mix on the board. For example, the positive association of both Medicare case mix and physicians as percentage of staff with nonrepresentative consumer board members suggests that perhaps older, retired professionals and physicians themselves may be the ones serving on the board. The lack of an association between aggregate patient and community demographics and board composition suggests that board member selection is highly targeted and is not limited in any way by the pool of potential available board members. And, importantly, the regression models confirm that boards are becoming less descriptively representative over time.
Data from qualitative interviews confirm the lack of descriptive representation and suggest that it is driven more by socioeconomic gaps than by differences in race, gender, or geographic residence. They also indicate that self-reported consumer status may be less than ideal in other important ways, as some self-reported consumers did not consider the FQHC their usual source of care, did not use the FQHC for primary care, or did not become consumers until after joining the board. All these characteristics suggest a lack of shared experiences between consumer board members and the typical FQHC patient that stands to make them less descriptively representative (Dovi 2003; Mansbridge 1999). This may have important implications for how well FQHCs are able to relate and respond to the needs of the communities they serve.

These findings are consistent with the well-documented struggles to achieve descriptive representation in the early days of the health center program (Hochbaum 1969; Hollister 1974; Hollister, Kramer, and Bellin 1974; Paap 1978; Paap and Hanson 1982; Peterson 1970; Thompson 1980). However, more recent empirical studies did not identify deficiencies in descriptive representation (Bracken 2007; Latting 1983; National Rural Health Association 2005). This can be explained by the fact that these more recent studies considered consumers a homogeneous or nearly homogeneous group.

The results of this study clearly demonstrate that consumer homogeneity is a strong assumption and that there are in fact considerable differences among consumer board members, especially socioeconomic status, which should be taken into consideration. The reality is that some consumer board members are more descriptively representative of the typical FQHC patient than others.

Yet just because the level of descriptive representation is much lower than might be expected given the requirement of a consumer majority, it is important not to overlook the fact that FQHC boards are composed on average of 20–25 percent descriptively representative consumer board members. Given the obstacles to participation that members of this group tend to face, this level of descriptive representation is a notable achievement in and of itself. One can imagine, for example, how different the US Congress would look if it were to achieve this level of descriptive representation compared with the electorate. Moreover, even nominal consumer governance may yield community benefits (Banducci, Donovan, and Karp 2004). Thus the descriptive findings presented here should not be used to draw conclusions about the effectiveness of consumer governance.
This study has some limitations. While individual board members were coded into SOC groups as conservatively as possible, assumptions were made about the coding and categorization of board members. A cutoff of 200 percent of the federal poverty level for a family of four was assumed as the indicator of a high-status occupation. For single individuals or those in a smaller family, this will lead to a conservative estimate. However, for individuals from a larger family, this will tend to overstate income relative to poverty.

Furthermore, mean annual income for each occupation was used, although some occupations may have more variation in wages than others. For an individual at the lower end of the range, a higher mean income for the group may lead a descriptive consumer to be categorized as a non-descriptive consumer, while for individuals at the higher end of the range, a lower mean income for the group may lead a nonrepresentative consumer to be categorized as a representative consumer.

Finally, the use of average annual occupational income only directly accounts for one dimension of representativeness. While this measure is likely correlated with other dimensions such as education, it is not a perfect indicator. Consumer board members can be descriptively representative of the patient population in a variety of ways. Thus a continuous index — rather than a categorical measure — of descriptive representation would be the ideal solution. Unfortunately, no data were available to attempt this approach. The method used was conservative enough, however, to be confident that, if anything, the results may be understated.

Going forward, future studies of consumer governance should strive to identify relevant differences among consumer board members. While the Bureau of Primary Health Care requires consumer board members as a whole to “represent the individuals served by the health center in terms of race, ethnicity, and gender” (HRSA 1998a: 22), other important factors such as insurance status, income, and education level have not been addressed. Health status might also be an important factor, as patients who utilize more services (e.g., those with a chronic illness) are more knowledgeable about the care they receive and more comfortable voicing their concerns to decision makers than are patients who rarely use services (Schlesinger, Mitchell, and Elbel 2002).

Future studies might also focus on understanding barriers to descriptive representation and designing ways to enhance levels of descriptive representation in practice. Board composition is ultimately the result of board member selection. Prior qualitative research finds that FQHC staff often
identify potential consumer board members without making their patient status a primary consideration in their selection, because it is challenging to find the expertise needed for governance among the FQHC’s patient population (Bracken 2007). While the current study reinforces these findings, a longitudinal case study of select FQHCs could provide valuable data on actual board member selection processes. At the very least, further inquiry into the role and contributions of descriptively representative consumer board members is warranted.

To be able to answer these questions well, there is a need for HRSA to collect and share better data on FQHCs. For instance, it would be useful to have governance data on board member age, gender, race, education level, and income. It would also be helpful to collect data on how long consumer board members have been receiving care at the center and how many visits for care they make annually. Finally, HRSA should consider making FQHC governance data publicly available in an electronic format to facilitate continued research into an important aspect of one of the nation’s most highly regarded safety net providers.

At the same time as the FQHC program has been permanently authorized and received the largest funding increase in its history, there is an ongoing debate about the effectiveness of consumer governance and the appropriateness of making certain federal funding contingent on having a consumer majority board. Many hospitals, free clinics, and other safety net providers without consumer majority boards are ineligible for the federal grant funds and enhanced Medicaid reimbursement rate that FQHCs enjoy.

While this study cannot speak directly to the effectiveness of consumer governance, it provides the first empirical evidence about the composition of FQHC governing boards and, given the limited involvement of descriptively representative consumers on the board, raises questions about the potential of consumer governance to affect health center outcomes. Answering these questions is essential to informing the policy debate over consumer governance in health care.
### Appendix

**Table A1** Coding Board Member Occupation /Expertise

<table>
<thead>
<tr>
<th>Variable Label</th>
<th>Standard Occupational Classification Code</th>
<th>Includes the Following Occupation/Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>11–0000 a</td>
<td>Administration, Administrative Director, Asset Manager, Banker, Business Management, Chief Financial Officer, Contractor, Corporate Employment, Facility Management, Finance Manager, Funeral Homes Owner, Governance, Health Care Foundation, Health Care Management/Operations, Hospitality, Hospital Administration, Human Relations, Human Resources, Industrial Safety and Environment Officer, Labor Relations, Leadership Training, Loan Officer, Medicaid Manager, Management (not otherwise specified), Multicultural Coordinator, Nonprofit Boards, Operations Manager, Personnel, Physician Recruiter, Producer, Program Coordinator, Public Administration, Public Health Administration, Senior Staff Associate, Workers Compensation</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Variable Label</th>
<th>Standard Classification Code</th>
<th>Includes the Following Occupation/Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education administration</td>
<td>11–9039a</td>
<td>Administration/Education, Board of Education, Education/Administration, Principal, School Administrator/Administration, School Development, School District Outreach, School Health and Safety Officer, School Official, School Superintendent, School Transition Coordinator, University Relations</td>
</tr>
<tr>
<td>Events</td>
<td>13–1121</td>
<td>Marketing/Event Planning</td>
</tr>
<tr>
<td>Accountant</td>
<td>13–2011a</td>
<td>Accountant, Accounting, Accounting Clerk, Controller, Accounting Partner, CPA, Tax Preparation</td>
</tr>
<tr>
<td>Variable Label</td>
<td>Standard Occupational Classification Code</td>
<td>Includes the Following Occupation/Expertise Values from Exhibit D of Federally Qualified Health Center Grant Applications</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Information technology</td>
<td>15−0000</td>
<td>Computers (IT), Computer Analyst, Data Analyst, IBM, Information Technology, Management Information Systems, School Media Specialist, Systems Analyst, Systems Manager, Technology</td>
</tr>
<tr>
<td>Architect/engineer</td>
<td>17−0000</td>
<td>Architect, Architecture, Biomedical Engineer, Chemical Engineer, Civil Engineer, Engineer, Engineering, Surveyor</td>
</tr>
<tr>
<td>Scientist</td>
<td>19−0000</td>
<td>Biologist, Chemist, Clinical Research, Epidemiologist, Environment/alist, Environmental Scientist, Geologist, Health Research, Herbologist, Medical Researcher, Microbiologist, Researcher</td>
</tr>
<tr>
<td>Psychology</td>
<td>19−3031</td>
<td>Behavioral Health (plus a PhD), Clinical Psychology, Early Childhood Development, Mental (plus a PhD), Mental Health Counselor (plus a PhD), Psychology, Social Service (plus a PhD), Social Work (plus a PhD)</td>
</tr>
<tr>
<td>Social work</td>
<td>21−1000</td>
<td>Addiction Specialist, Caseworker, Children and Youth Services, Community Counseling, Community Social Services, Counseling, Clinical Social Worker, Department of Family and Child Services, Domestic Violence, Employment/Job Training, End Hunger, Family Services, Head Start, Housing, Human Services, Job Programs, Job Training, Migrant Head Start, Masters of Social Work, Licensed Clinical Social Worker, Service Organization, Social Services, Social Work/ers, Substance Abuse Services, Supportive Living Caseworker, Temporary Assistance for Needy Families, Work Study Job Counselor, Therapist, Vocational Instructor, Youth Services</td>
</tr>
<tr>
<td>Clergy</td>
<td>21−2011</td>
<td>Bishop, Chaplain, Church Minister, Clergy, Faith Based, Hospital Chaplain, Islamic Center, Migrant Ministry Coordinator, Minister, Priest, Religion, Religious Leader, Senior Pastor, Spanish American Baptist Church, Spiritual Counselor</td>
</tr>
</tbody>
</table>

(continued)
Table A1  Coding Board Member Occupation /Expertise (continued)

<table>
<thead>
<tr>
<th>Variable Label</th>
<th>Standard Occupational Classification Code</th>
<th>Includes the Following Occupation/Expertise Values from Exhibit D of Federally Qualified Health Center Grant Applications</th>
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</thead>
<tbody>
<tr>
<td>Lawyer</td>
<td>23 – 1011a</td>
<td>Attorney-at-Law, Attorney, Circuit/Trial Court Judge, County Judge, Deputy City Attorney, District Attorney, Health Care Law, Insurance Law, Judge, Juvenile Courts, Law, Lawyer, Law &amp; Legislation, Legal, Legal Advice, Legal Affairs, Legal Aid, Legal Services, Prosecuting Attorney’s Office, Superior Court Judge</td>
</tr>
<tr>
<td>Paralegal</td>
<td>23 – 2011</td>
<td>Legal Assistant, Paralegal</td>
</tr>
<tr>
<td>Professor</td>
<td>25 – 1199 a</td>
<td>Academic Professor, Alaska Bible College Educator, Business (plus a PhD), Chancellor (plus a PhD), College Instructor, College Professor, Community College Teacher, Dental Instructor, Education (plus a PhD), Educator/Law, Executive (plus a PhD), Higher Ed, Law Educator, Marketing (plus a PhD), Medical School Administration (plus a PhD), PhD (unspecified occupation), Religion and Ethics (plus a PhD), Researcher, ScD, Small College Instructor, University (plus a PhD), University Lecturer</td>
</tr>
<tr>
<td>Teacher</td>
<td>25 – 3099 a</td>
<td>Education, Educator, Migrant Education, Migrant Teacher, School System, School Teacher, Substitute Teacher, Teacher, Teaching</td>
</tr>
<tr>
<td>Librarian</td>
<td>25 – 4021 a</td>
<td>Education/Library Science, Librarian</td>
</tr>
<tr>
<td>Dentist</td>
<td>29 – 1021 a</td>
<td>Dental, Dentist, Dentistry, DDS, DMD</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>29 – 1051 a</td>
<td>Doctor of Pharmacy, Pharmacist, Pharmacy</td>
</tr>
<tr>
<td>Variable Label</td>
<td>Standard Occupational Classification Code</td>
<td>Includes the Following Occupation/Expertise Values from Exhibit D of Federally Qualified Health Center Grant Applications</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Physician</td>
<td>29 – 1069&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Alternative Medicine, DO, MD, Medical (not otherwise specified), Medical Care (plus an MD), Medical Education, Medical Evaluation, Medicine, Physician, Provider, Specific Types (e.g., Geriatric Specialist, Psychiatrist, OBGYN, Internist)</td>
</tr>
<tr>
<td>Nurse</td>
<td>29 – 1111&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Adult Nurse Practitioner, Community Health Nurse, District Nurse, Family Nurse Practitioner, Nurse, Nursing, Nurse Practitioner, Parish Nurse, Public Health Nurse, Registered Nurse, School Nurse</td>
</tr>
<tr>
<td>Veterinarian</td>
<td>29 – 1131&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Veterinarian, Veterinary Medical Records, Medical Transcriptionist</td>
</tr>
<tr>
<td>Medical records</td>
<td>29 – 2071</td>
<td>Medical Records, Medical Transcriptionist</td>
</tr>
<tr>
<td>Health</td>
<td>29 – 9099&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Acupuncture, Alternative Therapy, Ambulatory Health Care Operations, Behavioral Health, Chiropractor, Clinical, Clinician, Community Health, County Health Department, Healthcare, Health Education, Environmental Services, Health, Health Services, Hospice Care, Hospital, Hospital Employee, Managed Care, Medical Lab Technologist, Mental Health, MH/MR, MPH, Nutrition, Occupational Therapy, Optometry, Oral Health Care, Physical Therapy/ist, Physician’s Assistant, Primary Care Organization, Public Health, Radiology Technician, Rehabilitation Services, Rural Health, Ryan White, School Health, Speech-Language Therapist, Women, Infants &amp; Children</td>
</tr>
<tr>
<td>Health care support</td>
<td>31 – 0000</td>
<td>Allied Health Services, Assistant to Handicapped, Care Giver, Caretaker, Chiropractic Assistant, Certified Nursing Assistant, Community Health Worker, Dental Assistant, Home Care, Home Health Aide, Massage Therapist, Medical Assistant, Medicare, Nurse’s Aide, Nursing Assistant, Outreach Coordinator, Refugee Health Mentor, Resident Caretaker, Spiritualist Healer</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Variable</th>
<th>Standard Occupational Classification Code</th>
<th>Includes the Following Occupation/Expertise Values from Exhibit D of Federally Qualified Health Center Grant Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective service</td>
<td>33–0000</td>
<td>Animal Control, Border Patrol Agent, City of Richmond Fire Department, Constable, Corrections, Criminal Justice, Emergency Mgmt., Emergency Responder, Emergency Medical Services, Emergency Medical Technician, Fire Department, Juvenile Justice, Juvenile Officer, Juvenile Probation, LA County Probation, Law Enforcement, Marshall/Supreme Court, Parole Officer, Police Officer, Prison Guard, Security, State Probation Agent, State Trooper, Tribal Police Officer</td>
</tr>
<tr>
<td>Protective service managers</td>
<td>33–1021a</td>
<td>Assistant Fire Chief, Customs Officer, Deputy Sheriff, EMS Director, Fire Battalion Chief, Fire Chief, Police Captain, Police Chief, Sheriff, US Marshal</td>
</tr>
<tr>
<td>Food service</td>
<td>35–0000</td>
<td>Food Service, High School Cafeteria, Restaurant, School Cook, Supervisor Food Services, Waitress</td>
</tr>
<tr>
<td>Cleaning</td>
<td>37–0000</td>
<td>Domestic Services, Facilities, Housekeeper/ing, Janitorial Services, Landscaper, Office Cleaner</td>
</tr>
<tr>
<td>Service</td>
<td>39–0000</td>
<td>Barber, Cosmetologist, Fitness, Florist, Hair Dresser, Hair Stylist, Hostess, Interior Designer, Mortuary Assistant, Physical Fitness Trainer, Service Sector, UPS</td>
</tr>
<tr>
<td>Child care</td>
<td>39–9011</td>
<td>Childcare, Foster Care</td>
</tr>
<tr>
<td>Retail</td>
<td>41–0000</td>
<td>Auto Parts Merchant, Car Salesman, Commerce, Good Year Tire, Retail Entrepreneur, Retail Sales, Sales, Sales Representative, Salvation Army, Store Manager</td>
</tr>
<tr>
<td>Real estate</td>
<td>41–9021a</td>
<td>Real Estate, Realtor, Realty, Home Specialist Administrative Assistant, Administrative Tech, Bank Teller, Bookkeeping, Business Support, Clerical, Clerk, Clinic Manager, Customer Service, Dispatcher, Expediter, Hotel Worker, Institutional Aide, Legal Secretary, Medicaid Eligibility Worker, Office Manager, Para Professional, Parliamentarian, Payroll, Receptionist, School Aide, School Assistant, School Registrar, Secretary, Service Coordinator</td>
</tr>
<tr>
<td>Administrative support</td>
<td>43–0000</td>
<td>Real Estate, Realtor, Realty, Home Specialist Administrative Assistant, Administrative Tech, Bank Teller, Bookkeeping, Business Support, Clerical, Clerk, Clinic Manager, Customer Service, Dispatcher, Expediter, Hotel Worker, Institutional Aide, Legal Secretary, Medicaid Eligibility Worker, Office Manager, Para Professional, Parliamentarian, Payroll, Receptionist, School Aide, School Assistant, School Registrar, Secretary, Service Coordinator</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>Farmer, Farm Worker, Farmworking Family, Forester, Grower, Horticultural Worker, Logging, Lumber, Migrant Farmworker, Migrant and Seasonal Farm Worker, Orchardist, Organic Farmer, Pear Orchard Manager, Rancher, Ranching, Rural Farmer, Seasonal Worker, Timber Worker, Tree Farmer</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Carpenter, Coal worker, Electrician, Infrastructure, Labor, Laborer, Materials Management, Molder, Painter, Plumber, Steel Worker</td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>APS Utilities, Embroiderer, Factory Worker, Manufacturing, Mill Worker, Plant Worker, Plateau Electric Cooperative, Poultry Plant, Power Company, Public Utilities, Refinery, Seamstress, Telephone Company, The Gas Co., Water Department, Water District Manager</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>Longshoreman, Public Transportation, Railroad, Railroad Worker, School Bus Driver, Trucker</td>
<td></td>
</tr>
<tr>
<td>Consumer</td>
<td>Advocacy, African-American Community, Aging, American Legion, Bosnian Representative, Church Volunteer, City Representative, Civic, Community, Community Activist, Community Advocate/Advocacy, Community Affairs, Community Liaison, Community Member, Community Needs, Community Organizer/Organization, Community Rep, Community Resident, Community Service, Community Volunteer, Consumer Issues, Cultural Competence, Former Homeless, Haitian Community, Disability Advocate, Disabled, Formerly Homeless, General, General Community, Health &amp; Tribal, Health Care for the Homeless, HIV Advocacy, Hispanic Representative, Home Economist, Homeless, Homeless</td>
<td></td>
</tr>
</tbody>
</table>

*(continued)*
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Retired</td>
<td>Retired (no other expertise specified)</td>
</tr>
<tr>
<td>Other</td>
<td>Cable Services Staff, Compliance, Cosmetologist, Foster Care, Hospitality, Swim Instructor, Theatre, Tourism, Trailer Park Manager, Travel Agent, Youth, Student</td>
</tr>
</tbody>
</table>

*Indicates a high-status occupational group based on average annual income greater than 200 percent of the federal poverty level for a family of four in 2009 ($44,100).


Hollister, Robert M. 1974. “Neighborhood Health Centers as Demonstrations.” In


StataCorp. 2007. Stata Statistical Software: Release 10. College Station, TX: StataCorp.


