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Location of usual source of care among children and adolescents in the US, 1997–2013

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Abstract

Objectives—To examine national trends in the percentage of children whose usual source of care is at a clinic, health center, or hospital outpatient department (hereafter “clinics”) and whether trends differ by sociodemographic subpopulations. Clinics have a greater percentage of patients from vulnerable populations than do physician’s offices and trends in their use as a usual source of care have not previously been described.

Study design—Analysis of serial, cross-sectional, nationally representative in-person household surveys, the 1997–2013 National Health Interview Surveys, was conducted to identify children with a usual source of care (n=190,571), and the percentage receiving that care in a clinic. We used Joinpoint regression to identify changes in linear trends, and logistic regression with predictive margins to obtain per-year changes in percentages, both unadjusted and adjusted for sociodemographic factors. Interaction terms in logistic regressions were used to assess whether trends varied by sociodemographic subgroups.

Results—Of all children with a usual source of care, the percentage receiving that care in a clinic declined 0.44 percentage points per year ($p<0.001$) from 22.97% in 1997 to 19.31% in 2002. Thereafter, it increased approximately 0.57 percentage points per year ($p<0.001$), reaching 26.1% in 2013. Trends for some sociodemographic subgroups varied from these overall trends. No

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changes were observed between 2003 and 2013 for non-Hispanic black and Medicaid/SCHIP insured children.

Conclusions—This study shows that, although the percentage of children with a usual source of care in a clinic declined between 1997 and 2002, it has steadily increased since that time.

Keywords

clinics; safety net; trends

Introduction

In 2011–2012, 95.9% of US children had a usual source of health care (USOC). [1] Children with a USOC have been shown to be more likely than those without to have seen a physician during the last year,[2] have received preventive health counseling,[3] and have lower levels of unmet need.[4, 5] However, children's usual sources of medical care occur in a variety of locations. In 2012, among children with a USOC, 23.9% of children received care at a clinic or health center, and 1.0% at a hospital outpatient department (OPD).[6]

Visits to physicians' offices account for more than 80% of all visits to primary care delivery sites,[7] and hence, even among vulnerable subpopulations of children, a majority of children with a USOC receive their care in physicians' offices.[6] Clinics, health centers, and hospital outpatient departments (hereafter referred to as "clinics"), also provide primary care services, but serve different populations than those served by private physicians' offices. In clinics, a greater percentage of patients are minority, from lower income families, have public insurance, and are in worse health compared to physician's offices.[6–10] Further, children with a USOC in some types of clinics (OPD or emergency department) are less likely to have seen a physician during the last year.[2] As such, clinics play an important role in our health care system as they often focus upon providing care for underserved populations.[11–13]

Understanding the percentage of children that receive care in clinics can facilitate insight about the fundamental structure of the health care system, including the support provided by clinics to vulnerable populations. The structure of a health care system may affect the quality of care provided,[14] and previous research suggests that patient panels that have a greater percentage of minority and non-English speaking patients may experience lower quality of care.[15] Therefore, changes over time in the percentage of children that receive care in clinics may be helpful for those trying to understand changes and disparities in quality of care.

As the percentage of children enrolled in public insurance has increased over time,[1] it is possible that changes in location of care have occurred as well. Also, the President's Health Center Initiative in 2002 increased the number of federally qualified health centers [4, 16], and this may also have had an effect on where care is received. Hoilette, et. al examined US children between 1998 and 2006 and did not observe changes in locations of usual source of care between 1998–2006 for any insurance type.[4] However, between 2006 and 2013, the percentage of children and adolescents with public health insurance has continued to

increase, from 32.3% to 42.2%, while the percentage with private insurance has declined from 59.7% to 52.6%. [17] Examination of whether a shift towards clinics has occurred over the period since 2006 has not been conducted. This analysis describes trends in having a USOC at clinics and explores whether trends vary by sociodemographic factors.

Methods

Data Source

Data are from the 1997–2013 National Health Interview Survey (NHIS), a nationally representative, cross-sectional complex, multistage survey, conducted continuously since 1957 by the National Center for Health Statistics (NCHS). [18] The year 1997 was selected as a starting point because the NHIS was redesigned at that time, making data consistent from that point to 2013, the most recent year for which data are available. Within each household, a sample child 0–17 years of age was selected, and information about the sample child was obtained from in-person interviews with an adult residing in the household who is knowledgeable about the child's health. NHIS interviews are conducted continuously throughout each year. [18] The response rate for the sample child file ranged from 84.1% in 1997 to 69.0% in 2013. [19] The NHIS data collection has been approved by the NCHS Ethics Review Board. No further review was required for this data analysis.

Variables

Children were identified as having a USOC if the adult answered “yes” to the question, “Is there a place that (the child) usually goes when he/she is sick or you need advice about his/her health?”. For respondents that answered “yes”, a second question of “what kind of place does (the child) go to most often?” was asked, with answer categories of 1) clinic or health center, 2) doctor's office or HMO, 3) hospital emergency room, 4) hospital outpatient department, or 5) some other place. Respondents who stated they had a USOC, but the place of care was the hospital emergency room were not considered to have a USOC, consistent with the definition used by Healthy People. [20] Two additional questions were asked that focused on whether the child had a usual place to go for “routine or preventive care, such as a physical examination or well-baby/child check-up” (i.e., a usual source of preventive care) and the location of that care (using similar response categories described above).

Locations of usual sources of care were categorized as clinics (clinic, health center, or a hospital outpatient department) or physician's office. The main outcome of interest was the percent of children receiving care at a clinic among children with a USOC. All analyses were also conducted using a secondary outcome of the percent of children receiving preventive care (e.g., well checks) at a clinic among children with a USOPC, but results were largely similar and, hence, are not presented.

Covariates included year, age, sex, insurance type, race/ethnicity, health status, US census region, urban-rural status (from the NCHS urban-rural classification scheme for counties), [21] family income-to-poverty ratio and highest level of education in the household. These variables were selected based on a previous examination of locations of usual sources of care, and trends over time. [22] These variables are of value to explore because they describe

which sociodemographic groups might be increasing in their use of clinics as a USOC, highlighting how patient populations may be changing within clinics.

Between 1997 and 2013, there were 207,007 children in the NHIS sample child files. Multiply imputed values for the 22.3% of children with missing income-to-poverty ratio, and singly imputed values for the 7% of children with missing race/ethnicity were provided by the NHIS and imputations were used for all analyses. After inclusion of imputed values, approximately 1.6% of children had missing data, resulting in 203,732 children with complete data and information on USOC, respectively. Across all years of data, 94.4% (SE: 0.1) of these children reported a USOC (un-weighted $n=190,571$); this serves as the final analytic sample for analyses of location of care among children with a USOC.

Analysis

Yearly estimates of the percent of children with a USOC at a clinic were entered into Joinpoint regressions with year as the independent variable (Joinpoint v.3.5.1). Joinpoint allows changes in trends to be identified based on the patterns of the data, rather than a priori assumptions about when trends might have changed. Joinpoint first fits the simplest linear model and subsequently uses a series of Monte Carlo permutation tests to determine whether 1 or more changes in linear trend have occurred.[23]

The odds of receiving care in a clinic were examined using survey-weighted logistic regressions in Stata 12.1 SE, accounting for the survey design and multiply imputed data. The first set of models examined bivariate relationships between receiving care in a clinic and each covariate of interest. All estimates were based on more than 30 observations and had a relative standard error of less than 30%. Nonlinear trends over time were examined by including year spline terms based on knots identified in the joinpoint regression (1997–2002, 2003–2013). To determine whether trends over time could be attributed to shifts in demographic characteristics, a multivariable model included all independent variables. Results are presented as predictive margins and show the percentage point difference between groups, or the average yearly change in percentage points for the year spline terms.

To identify whether trends differed across sociodemographic categories, a final set of models included interaction terms between independent variables and each year spline. Interaction terms were considered significant based on an F-test (at the $p<0.05$ level) suggesting that various socio-demographic groups exhibit different time trends in the likelihood of identifying clinic as their USOC.

Results

Trends in USOC

Of all children in our analytic sample, the percentage with a usual source of care ranged from 93.02% (SE: 0.29) in 2000 to 95.96% (SE: 0.21) in 2013. Of all children with a USOC, the percentage receiving care in a clinic (e.g., clinic, health center, or hospital outpatient department) declined 0.44 percentage points per year ($p<0.001$) from 22.97% (SE: 0.72) in 1997 to 19.31% (SE: 0.67) in 2002 (Table 1, Figure 1). The percentage increased thereafter

to 26.1% (SE: 0.72) in 2013, an average annual increase of 0.57 percentage points ($p < 0.001$).

Adjusted trends in USOC

In multivariable models (data not shown), the estimated annual decline in using a clinic as a USOC between 1997 and 2002 remained the same (0.44 percentage points decline; SE: 0.12) after controlling for sociodemographic characteristics ($p < 0.001$). The increase in the proportion of children with a clinic as their USOC from 2003 to 2013 was attenuated after adjustment, but remained significant and positive (yearly increase of 0.20 percentage points; SE: 0.09, $p < 0.05$).

Factors associated with having care in a clinic

In bivariate analysis, across all years of data, younger children (0–1 years of age) were more likely to have a clinic as their USOC compared to those 2–5 years, 6–11 years, and 12–17 ($p < 0.001$ for all comparisons) (Table 1). For children with a USOC, the percentage receiving care in a clinic was significantly lower among privately insured children compared to those with Medicaid/SCHIP/or other state insurance programs, other insurance (Medicare, military coverage, another government program), and those who were uninsured ($p < 0.001$ for all comparisons). Non-Hispanic white children were less likely to have a clinic as their USOC than children who were non-Hispanic black, non-Hispanic other/multiple race, and Hispanic ($p < 0.001$ for all comparisons). Compared to children reported to be in excellent health, those in good health and those in fair/poor health were more likely to have a clinic as their USOC ($p < 0.001$ for both). Compared to children in the Northeast, those living in the Midwest, South and West were more likely to use a clinic as their USOC ($p < 0.001$ for all comparisons). Children in large fringe metro areas and medium/small metro areas were less likely to use a clinic as their USOC compared to those in large central metro areas ($p < 0.001$ for both). Finally, those with greater family income were less likely than those with lower family income to have a clinic as their USOC and children with a family member reporting higher levels of education were less likely than those with family members having lower levels of education to use a clinic as their USOC.

Trends in USOC for sociodemographic subgroups, 1997–2002

Unadjusted trends in the percentage of children receiving their usual care in a clinic differed significantly for several sociodemographic characteristics (Table 2). The overall trend between 1997 and 2002 was a decline in the percentage of children reporting a clinic as their USOC, and there was no difference in that trend by subgroups of age, sex, insurance type, health status, income-to-poverty, or household education level during that time period. Within the variables where differences from the overall trend for the period existed (significant interaction terms), many subgroups exhibited significant decreases over this time period, consistent with the overall trend for the time period. These included children who are: non-Hispanic white, non-Hispanic black, in the south, in medium/small metropolitan areas and in micropolitan/non-core areas. Several subgroups, however, exhibited no significant change in the percentage using a clinic as their USOC over that time period, including non-Hispanic other/multiple race children, children living in the Northeast, Midwest, and West, and children in large central metro and large fringe metro counties.

Hispanic children, however, exhibited a significant increase in the percentage using a clinic as their USOC (an annual 0.72 percentage point increase).

Trends in USOC for sociodemographic subgroups, 2003–2013

Between 2003 and 2013, the general trend was an increase in the percentage of children using a clinic as their USOC, and there were no differences in this trend by subgroups of age, sex, region, urban/rural category, or household education. Within the variables where differences from the overall trend for the period existed (significant interaction terms), there was a significant increase in the percentage of children with a USOC in a clinic among children with private insurance, uninsured children, non-Hispanic white children, Hispanic children, those in excellent/very good and good health, and children at <100% and those between 200% and <400% of FPL, consistent with the overall trend for the period. There was no significant change over time in the percentage with a USOC in a clinic among children with Medicaid/SCHIP/or other state insurance, non-Hispanic black and non-Hispanic other/multiple race children, children in fair/poor health, and children at 400% or 100–<200% of FPL. There was a significant decline among children with “other” insurance (including military insurance, Medicare, and other government programs), (1.19 percentage points per year, $p<0.05$).

Discussion

In general, the percentage of children who used a clinic (e.g., clinic, health center, or hospital outpatient department) for their usual source of care (USOC) declined between 1997 and 2002, but then increased thereafter, reaching a high of approximately one-quarter of children in 2013. The average yearly increase of 0.57 percentage points from 2003 to 2013 represents approximately 419,000 additional children using a clinic as their USOC each year (using 2013 estimates of the non-institutionalized population of 73.5 million children less than 18 years of age).

This increase is consistent with findings by others suggesting that both the number of federally-funded community health centers (or federally qualified health centers—FQHCs) and the number of patients they serve has increased since 2001.[16] FQHCs cannot be identified in this survey, as several criteria must be met to qualify as an FQHC. However, it is likely that most FQHCs (and FQHC look-alikes) would fall into the category of providers that we identify as clinics as FQHCs must serve underserved areas or populations and must be non-profit or public entities.

In general, children with traditional sociodemographic risk factors (e.g., low-income, public insurance) are more likely to have a USOC in a clinic. However, it remains unclear whether these differences in care location by sociodemographic factors are related to the quality of health care received. Based on the most recent comparisons of care, practice patterns at clinics have been shown to differ from those seen in physician’s offices. For example, care in health centers has been shown to be associated with higher rates of laboratory testing and receiving prescription medication compared with physician’s offices.[9] Given the increase in the percentage of children that are receiving care in clinics, future research might aim to understand whether this variation in care reflects differences in care quality.

In recent years, there has been great focus on whether care is received in a medical home, [24–26] and some evidence suggests that medical homes provide improved quality of care. [27–29] However, it is unknown whether being a medical home is related (positively or negatively) to being a clinic, and whether similar aspects of care are affected by being a medical home and by being a clinic.

Finally, although trends for most subgroups mirrored the overall time trends, significant differences were seen for some subgroups and time periods. For example, while overall trends showed a decline between 1997 and 2002 in the percentage of children with a USOC in a clinic, Hispanic children showed increases during that period. Similarly, while overall trends between 2003 and 2013 showed increases in the rate of receiving care in these locations, a decline was seen among those with Medicare or Military insurance programs.

Finally, Hoilette, et. al. hypothesized that, since the President's Health Center Initiative in 2002, the percentage of children having a USOC in a clinic or health center would increase. [4] However, Hoilette observed no changes between 1998 and 2006 in the percent of children with a USOC at a clinic or health center within any insurance group.[4] In contrast, we observe declines overall in having a USOC or a USOC in a clinic between 1997 and 2002 and an increase between 2003 and 2013. By insurance type, we observed declines in having a USOC in a clinic across all insurance types between 1997 and 2002 and increases in the percentage of children with a USOC in a clinic between 2003 and 2013 for children with private insurance, although not for children with Medicaid.

This study has some limitations. Most notably, the location of care is obtained by parent report and may be open to some interpretation on the part of the survey respondent. However, to our knowledge, it is the best available source for studying these trends at a national level. Also, although we are able to track trends in the percentage of children whose USOC is in a clinic, we are not able to identify the factors that have caused this trend. More detailed information on physician and clinic supply and patient choice would be required to identify the driving factors of trends observed. Also, missing data for covariates may affect adjusted results, although imputed data provided by NHIS were used where possible. Finally, there may have been limited power to detect differences between some subgroups.

In conclusion, this study shows that, although the percentage of children with a usual source of care in a clinic, health center, or hospital outpatient department declined between 1997 and 2002, it has steadily increased since that time. In 2013, more than one quarter of children have a usual source of care in a clinic, health center, or hospital outpatient department.

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Abbreviations

USOC usual source of health care

OPD	hospital outpatient department
USOPC	usual source of preventive care
NHIS	National Health Interview Survey
NCHS	National Center for Health Statistics
SE	Standard Error

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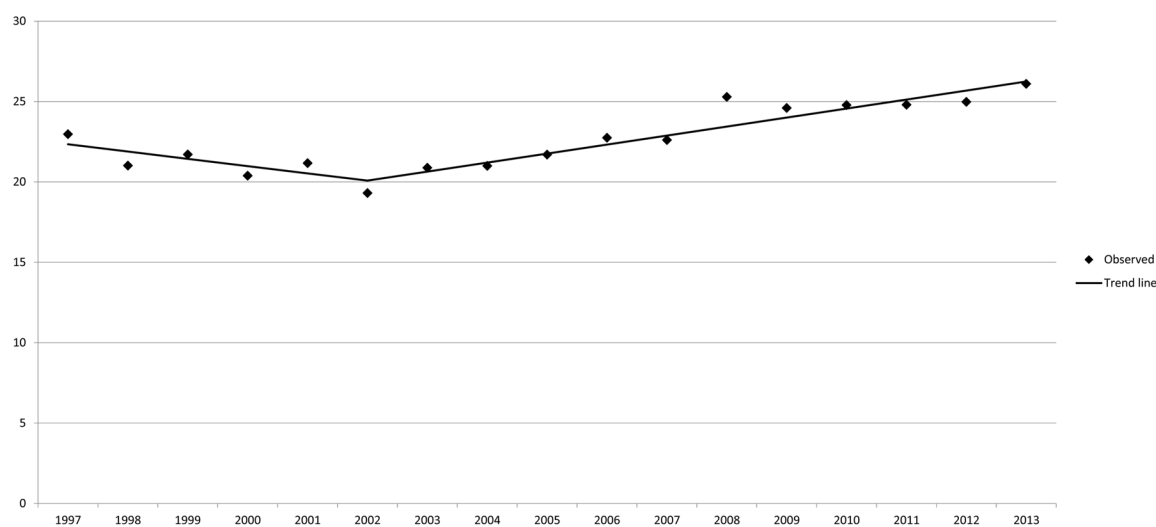


Figure 1. Percent of all children with a usual source of care that received that care in a clinic, health center, or hospital outpatient department

Note: Estimates obtained from joinpoint, which indicated a significant change in slope in 2002.

Table 1

Percent differences in children with a usual source of care whose usual source of care was in a clinic, health center, or hospital outpatient department, by year and sociodemographic factors, 1997–2013 (Bivariate associations)[†]

Receiving care in a clinic, health center or hospital outpatient department of those with a usual source of care		
	Bivariate Predictive Margins (n=190,571)	SE
Years		
1997–2002 (per year change)	−0.44***	0.13
2003–2013 (per year change)	0.57***	0.10
Age		
0–1	Ref	
2–5	−2.23***	0.44
6–11	−3.27***	0.43
12–17	−3.54***	0.44
Sex		
Male	Ref	
Female	0.12	0.24
Insurance Type		
Private	Ref	
Medicaid/SCHIP/Other state insurance	23.59***	0.49
Other insurance	33.03***	1.68
uninsured	27.75***	0.70
Race/Ethnicity		
Non-Hispanic white	Ref	
Non-Hispanic black	12.08***	0.68
Non-Hispanic other/multiple race	8.76***	0.97
Hispanic	21.70***	0.71
Health status		
Excellent/very good	Ref	
Good	9.33***	0.44
Fair/poor	11.43***	1.05
Region		
Northeast	Ref	
Midwest	12.70***	1.17
South	4.13***	0.64
West	13.83***	0.81
Urban-rural		
Large central metro	Ref	

Receiving care in a clinic, health center or hospital outpatient department of those with a usual source of care		
	Bivariate Predictive Margins (n=190,571)	SE
Large fringe metro (suburbs)	-13.05***	0.58
Medium and small metro	-3.98***	0.82
Metropolitan and non-core	2.16	1.52
Income to Poverty ratio		
400%	Ref	
300 – <400% FPL	4.04***	0.38
200 – <300% FPL	8.65***	0.42
100 – <200% FPL	18.22***	0.48
<100% FPL	28.67***	0.60
Highest level of Household education		
Greater than college	Ref	
College	2.54***	0.38
Some college/associates degree/technical degree	9.73***	0.45
High School/GDE	16.26***	0.53
Less than High School	34.13***	0.76

*
p<0.05

**
p<0.01

p<0.001

† Estimates for year groupings represent average percentage point change per year. For all other variables, estimates represent average percentage point differences between groups across all years of data, 1997–2013. Estimates are based on bivariate associations between each variable and having a usual source of care in a clinic, health center, or hospital outpatient department.

Table 2

Percentage point change per year (unadjusted) in percent of children with a usual source of care who received that care in a clinic, health center, or hospital outpatient department, by selected sociodemographic factors.

Receiving care in a clinic, health center or hospital outpatient department of those with a usual source of care				
Years	1997–2002	SE	2003–2013	SE
Total	−0.44***	0.13	0.57***	0.10
Insurance Type	N/A			
Private			0.32**	0.10
Medicaid/SCHIP/Other state insurance			0.21	0.14
Other insurance			−1.19*	0.46
uninsured			0.48*	0.23
Race/Ethnicity				
Non-Hispanic white	−0.67***	0.14	0.40**	0.13
Non-Hispanic black	−1.54***	0.31	0.12	0.17
Non-Hispanic other/multiple race	0.00	0.44	−0.01	0.25
Hispanic	0.72**	0.25	0.69***	0.15
Health status	N/A			
Excellent/very good			0.54***	0.10
Good			0.78***	0.15
Fair/poor			−0.13	0.34
Region			N/A	
Northeast	−0.20	0.25		
Midwest	−0.58	0.32		
South	−0.90***	0.18		
West	0.42	0.23		
Urban-rural			N/A	
Large central metro	0.16	0.21		
Large fringe metro (suburbs)	−0.28	0.18		
Medium and small metro	−0.78**	0.25		
Micropolitan and non-core	−0.87*	0.38		
Income to Poverty ratio	N/A			
400%			0.22	0.16
300 – <400% FPL			0.67***	0.14
200 – <300% FPL			0.49**	0.15
100 – <200% FPL			0.20	0.14
<100% FPL			0.29**	0.11
Highest level of Household education	N/A			
Greater than college				

Receiving care in a clinic, health center or hospital outpatient department of those with a usual source of care				
Years	1997–2002	SE	2003–2013	SE
College				
Some college/associates degree/technical degree				
High School/GDE				
Less than High School				

Note: N/A indicates no significant interaction term, thus subgroup differences are not presented. Otherwise F-test of interaction term was significant. Sex and age are also not presented, as interaction terms were not significant for any analysis.

*
p<0.05 for test comparing slope of line to no trend (slope=0).

**
p<0.01 for test comparing slope of line to no trend (slope=0).

p<0.001 for test comparing slope of line to no trend (slope=0).