



Published in final edited form as:

*J Adolesc Health*. 2014 June ; 54(6): 663–671. doi:10.1016/j.jadohealth.2014.03.001.

## Young Adults' Health Care Utilization and Expenditures Prior to the Affordable Care Act

Josephine S. Lau, MD, MPH<sup>1</sup>, Sally H. Adams, PhD, RN<sup>1</sup>, W. John Boscardin, PhD<sup>2</sup>, and Charles E. Irwin Jr., MD<sup>1</sup>

<sup>1</sup>Division of Adolescent and Young Adult Medicine, University of California, San Francisco, CA

<sup>2</sup>Department of Epidemiology and Biostatistics, University of California, San Francisco, CA

### Abstract

**Purpose**—Examine young adults' health care utilization and expenditures *prior* to the ACA.

**Methods**—We used 2009 Medical Expenditure Panel Survey (MEPS) to 1) compare young adults' health care utilization and expenditures of a full-spectrum of health services to children and adolescents and 2) identify disparities in young adults' utilization and expenditures, based on access (insurance and usual source of care) and other socio-demographic factors, including race/ethnicity and income.

**Results**—Young adults had: 1) significantly lower rates of overall utilization (72%) than other age groups (83-88%,  $P < .001$ ) and 2), the lowest rate of office-based utilization (55% vs. 67-77%,  $P < .001$ ) and higher rate of ER visits compared to adolescents (15% v. 12%,  $P < .01$ ). Uninsured young adults had high out-of-pocket expenses. Compared to the young adults with private insurance, the uninsured spent less than half on health care (\$1,040 vs. \$2,150/person,  $P < .001$ ), but essentially the same out-of-pocket expenses (\$403 vs. \$380/person,  $p = .57$ ). Among young adults, we identified significant disparities in utilization and expenditures based on the presence/absence of a usual source of care, race/ethnicity, home language and sex.

**Conclusions**—Young adults **may not be** utilizing the health care system optimally by having low rates of office-based visits and high rates of ER visits. The ACA provision of insurance for those previously uninsured or under-insured will likely increase their utilization and expenditures and lower their out-of-pocket expenses. Further effort is needed to address non-insurance barriers and ensure equal access to health services.

---

© 2014 Society for Adolescent Medicine. Published by Elsevier Inc. All rights reserved.

Address correspondence to: Josephine Lau, Division of Adolescent and Young Adolescent Medicine, 3333 California Street, Suite 245, San Francisco, CA 94118, 415-476-9618, laujs@peds.ucsf.edu.

**Contributors' Statement Page:** Dr. Lau conceptualized and designed the study, analyzed and interpreted the data, drafted the initial manuscript and approved the final manuscript as submitted. Dr. Adams supervised data analysis, interpreted findings, and critically revised the manuscript. Dr. Boscardin assisted in the development of multivariate models and critical review and revision of the manuscript. Dr. Irwin contributed in the conceptualization and design of the study and critical revision of the manuscript

**Publisher's Disclaimer:** This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Keywords

young adults; health care utilization; health care expenditures; Affordable Care Act

---

## Background

Young adults, considered as those aged approximately 18-25, have been increasingly described as a group with unique health care needs (1-3). Young adulthood is a period of development when maturation and skills acquisition (e.g. higher education and job training) are necessary for a successful transition to full adulthood. Young adulthood is often characterized as a healthier period than adolescence, however, young adults have higher rates of mortality and morbidity than adolescents including motor vehicle crashes, suicide, homicide, tobacco and other substance use, unintended pregnancies, and sexually transmitted infections (STIs)(3-7). Despite serious health issues, young adults have the lowest health insurance coverage rate of any age group (8-10). These low coverage rates have been linked to low ambulatory care utilization (11), few preventive care visits (11, 12) and services (11, 13), and high rates of delayed and forgone care (5, 14). Yet, we do not know how these low utilization rates relate to expenditures, type and duration of insurance coverage or health disparities among young adults. To date, only a few studies have focused on health care utilization of services, expenditures, the role of insurance and disparities for young adults (11, 12, 15-17). As of 2011, the Affordable Care Act (ACA) has already made significant impact by enabling 3 million young adults to gain insurance coverage through the provision of dependent private insurance coverage expansion up to age 26 (18). An in-depth understanding of these factors prior to full Affordable Care Act (ACA) implementation in 2014 will be helpful as insurance coverage level will change for this uninsured and underinsured age group (19-21).

The present study, using the 2009 Medical Expenditures Panel Survey (MEPS), has two aims: 1) to compare young adult patterns of health care utilization and expenditures to children and adolescents; and 2) to identify disparities based on access factors (insurance and usual source of care) and other demographic factors in health care utilization and expenditures among young adults.

## Methods

### Study Design and Sampling

We examined the 2009 MEPS data, publically available for research purposes. The 2009 data was selected because it represents the most recent available data on young adults status on health care and insurance prior to any aspect of ACA implementation. MEPS, a household survey of the US population, collects nationally representative data on socioeconomic characteristics, health, health insurance, medical care services utilization, and health expenditures (22). Detailed description of the sampling methodology is available in MEPS Data File Documentation (22). This study protocol was approved by the Committee on Human Research at University of California, San Francisco under the exempt status.

## Participants

Aim 1's comparisons of young adults' utilization and expenditures to children and adolescents utilized all 2009 MEPS participants under the age of 26 (n= 13,853). Age groupings included: children 0-11 years; adolescents 12-17 years; and young adults 18-25 years. These age ranges were chosen to provide relevant comparative analyses for pediatric/adolescent researchers and providers, thus expanding our knowledge of health care utilization and expenditures during the transition from adolescence to adulthood. Aim 2's examination of disparities in utilization and expenditures among young adults, used the 18-25 year old sample (n=3,768). The upper limit of age 25 was selected to be consistent with the age group identified in the ACA for extended health insurance coverage under parental insurance coverage effective in 2010.

## Utilization Outcomes

Participants reported their past-year use of health care services: office-based; hospital outpatient; emergency room (ER); dental; inpatient hospitalization; and prescription medications. Each item, coded yes versus no was aggregated into an overall dichotomous utilization variable coded as having used any service versus using none.

## Expenditure Outcomes

Participants reported all past-year expenditures for each type of service utilization described above. Expenditures were estimated in two ways: 1) per capita expenditures and per capita out-of-pocket expenditures by age groups (Aim 1); and 2) young adult average expenditures and out-of-pocket expenditures among those incurring expenses (Aim 2).

## Independent Variables (Aim 2)

**Access variables**—Young adults reported the presence or absence of a usual source of care and their insurance status. We created a 4-item insurance variable based on respondents' reports of the presence of and type of insurance they had for each month of the interview period: 1) full-year private insurance; 2) full-year public insurance, which included Tricare/Veteran Administration, Medicaid, Medicare, State Child Health Insurance Program (SCHIP), other state, local or federal public hospital/physician programs; 3) partial-year uninsured; and 4) full-year uninsured.

**Demographic variables**—Participants reported sex and language spoken at home (English vs. non-English). The race/ethnicity variables were recoded as follows: non-Hispanic White (referred to as White); non-Hispanic Black (referred to as Black); non-Hispanic Asian (referred to as Asian); Hispanic; American Indian/Alaskan Native (AIAN), Native Hawaiian/Pacific Islanders (NHPI), and Multiracial. The AIAN, NHPI, and Multiracial groups were excluded from the race/ethnicity subgroup analyses due to small numbers or subgroup heterogeneity. Household income, presented as a percent of the federal poverty level (FPL) (\$22,050 for a four-person family in 2009), was recoded into a 4-item FPL index: <100%; 100-199%; 200-399%; and ≥400%. Education levels were recoded into <12 years and ≥12 years. Student status was recoded to student (include both full-time and part-time) versus not. Employment status was recoded to employed and unemployed.

## Analysis Plan

For Aim 1, bivariate analyses were conducted to examine utilization and expenditures by age groups. As reproductive health plays a significant role in adolescent and young adult care, multivariate logistic regression controlling for pregnancy status (yes vs. no) were conducted between the adolescent and young adult groups. Wald F statistics were used to determine the significance level. For Aim 2, multivariate logistic regressions were conducted to determine the independent effect of each access and demographic factor on utilization and expenditures while controlling for pregnancy and health status. The health status variable is a five-level self-rating of health (from excellent to poor). For utilization outcomes (overall and visit/service subtypes), we estimated utilization rates and adjusted odds ratios (aORs). For the expenditure outcomes, we utilized a generalized linear regression model (GLM) with log link and gamma family distribution to estimate the average and out-of-pocket expenditures. We chose this model over an ordinary least squares regression model because the expenditure data is not normally distributed, has high zero mass, and is right-skewed. GLM with log link and gamma family distribution is the preferable model in similar data sets for estimating the effects of individual covariates on costs (23). Utilization rates, average and out-of-pocket expenditures for each subcategory of access and demographic factors were estimated using the margins command in Stata. This command utilizes a recycled predictions approach to properly adjust for the systematic differences in covariate distributions across the subcategories of each access and demographic factor (24). All analyses were conducted using Stata V.12 (StataCorp, College Park, TX). We applied weights available in the MEPS data sets and accounted for the complex survey design to generate frequency estimates that are nationally representative of the non-institutionalized civilian population.

## Results

### Demographics (Table 1)

There were equal proportions of females and males. Sixty percent were non-Hispanic White, with a roughly equal proportion of participants distributed across the four income groups. Forty-three percent of young adults had full-year private insurance, 9% had full-year public insurance, 27% were full-year uninsured and 21% were partial-year uninsured. Fifty-nine percent had a usual source of care. The majority had > 12 years of education; 52% were students and 64% were employed.

### Aim 1: Past-year health care utilization and expenditures across age groups (Table 2)

Young adults had the lowest rate of any health care utilization (72%) compared to children (88%,  $p<0.001$ ) and adolescents (83%,  $p<0.001$ ). Per capita expenditure in 2009 increased with age, from the lowest of \$1,506 for children, to highest of \$1,935 for young adults.

## Aim 2: Young adults' health care utilization and expenditures by demographic and access factors (Tables 3 & 4)

### Access factors

**Insurance:** Rates of any utilization were lower for young adults who were partial-year (74%,  $p<0.05$ ) or full-year uninsured (60%,  $p<0.001$ ) compared to those with full-year private insurance (81%). This pattern generally held for office-based, inpatient and dental visits, and prescription medication for those who were full-year uninsured. In contrast, young adults who were partial-year uninsured had higher ER rates than those who were full-year privately insured (19% vs. 13%,  $p<0.05$ ). There were no differences in overall utilization between young adults with full-year private vs. public coverage. However, those with public insurance were less likely to have dental visits than those with private insurance (30% vs. 45%,  $p<0.01$ ).

Young adults who were full-year uninsured had significantly lower overall expenditures than those with full-year private insurance (\$1,040 vs. \$2,150,  $p<0.001$ ). Young adults with full-year public insurance (\$204,  $p<0.001$ ) or only partial-year coverage (\$283,  $p<0.01$ ) spent significantly less on out-of-pocket expenses than those with full-year private insurance (\$380).

**Usual source of care:** Young adults without a usual source of care were less likely to use health services overall than those with a usual source (68% vs. 77%,  $p<0.001$ ). Rates for most types of visits were also lower for those without a usual care source, ( $p < 0.01 - 0.001$ ), excepting ER and inpatient hospitalization utilization. Those without a usual source of care had lower expenses than those with a usual source of care (\$1,383 vs. \$2,017,  $p < 0.01$ ).

### Demographic factors

**Sex:** Compared to males, females had significantly higher overall utilization (82% vs. 66%,  $p<0.001$ ) and higher rates of office-based (67% vs. 47%,  $p<0.001$ ), inpatient hospitalization (6% vs. 4%,  $p<0.01$ ) and prescription medications utilization (59% vs. 38%,  $p<0.001$ ) after controlling for pregnancy (Tables 3 & 4). Both overall and out-of-pocket expenditures for females were higher than males; \$2,099 vs. \$1,370,  $p<0.001$ , and \$379 vs. \$246,  $p<0.001$ , respectively (Table 3).

**Race/ethnicity:** Minority young adults were less likely to utilize health care overall and incurred lower expenditures compared to Whites. Blacks and Hispanics (64% and 67%, respectively) were less likely than Whites (78%) to have any utilization (Blacks  $p<0.001$ ; Hispanics  $p<0.01$ ). Expenditures for significantly lower for all minority groups: Blacks (\$1,139); Asian (\$987); and Hispanics (\$1374) compared to Whites (all  $p < 0.05$ ). All minority subgroups also had lower out-of-pocket expenses when compared to Whites (\$381): Blacks \$149,  $p<0.001$ ; Asians \$156,  $p<0.001$ ; and Hispanics \$224,  $p<0.01$ .

**Income:** Compared to young adults with income  $\geq 400\%$  FPL, low-income young adults ( $<100\%$  FPL) had significantly higher overall expenditures (\$2,860 vs. \$1,687,  $p<0.01$ ), but not out-of-pocket expenses. They also had higher rates of ER visits (21% vs. 13%,  $p<0.05$ ).

Young adults in the 200-399% FPL range had the lowest out-of-pocket expenses, significantly lower than the  $\geq 400\%$  FPL group,  $p < 0.001$ .

**Home language:** Compared to young adults speaking English at home, those not speaking English at home were less likely to utilize health services overall (65% vs. 75%,  $p < 0.001$ ) and had lower expenditures (\$1,088 vs. \$1,880,  $p < 0.05$ ).

**Education:** Overall utilization and expenditures did not differ between young adults with  $< 12$  and  $\geq 12$  years of education.

**Student and employment status:** Non-students were less likely to utilize services overall compared to students (69% vs. 77%,  $p < 0.001$ ) but had no significant difference in expenditures. Overall utilization and expenditures did not differ between young adults who were employed vs. unemployed.

## Discussion

The present study provides an overview of young adult health care utilization and expenditures by examining a broad set of health services. This expands our understanding of how young adults' health care utilization patterns and associated expenditures differ from children and adolescents and adds new perspectives on how young adults' out-of-pocket expenses place a disproportionate financial demand on the uninsured. Our finding of lower rates of overall utilization for young adults compared to other age groups supports previous research (12). The pattern of care that we found for young adults including low levels of office-based visits and somewhat higher usage of ER visits indicates less than optimal health care utilization. Increasing health care coverage for young adults is a target of the ACA. While being covered by insurance is a crucial factor in improving access to care, our study found that other demographic, economic and access factors beyond insurance status were associated with utilization and expenditures.

By itself, our finding that young adults were less likely to utilize health care overall is not a troubling result. However, low rates of office-based visits and somewhat higher rates of ER visits suggest that young adults may be using ER services in lieu of office-based care. Low office-based visit utilization is of concern for young adult health, given their relatively high rates of health problems in the areas of obesity, substance use disorders, mental health problems, unplanned pregnancies, and STIs (3-7), many of which can have lasting negative consequences across the life course. The receipt of preventive care during young adulthood may assist young people in developing strategies to manage the associated health problems.

Duration of being uninsured significantly influenced services utilization. Young adults lacking insurance for the entire year had the lowest utilization across all types of services (except for ER), confirming that insurance is essential in facilitating access to services and that many young adults use the ER as their only health care source as it is mandated to provide care regardless of an individual's ability to pay (25, 26). The utilization pattern among the partial-year uninsured is more complex. Their office-based visit rate is lower than the full-year insured, and their ER rate was higher than the full-year uninsured. Seeking care

at a medical office requires more logistical planning and initiative than in the ER. It is possible that having only partial-year coverage indicates some underlying instability, perhaps unstable job or housing situations, financial insecurity or other reasons that limit their ability to maintain coverage (e.g. lack of time, organization or knowledge). All these factors may predispose them to seek care in the ER over a medical office for convenience.

Our finding that the full-year uninsured had less than half of the health expenditures of full-year privately-insured, yet similar out-of-pocket expenses, highlights the heightened financial demand of out-of-pocket expenditures on uninsured young adults. This may be mitigated by expanding insurance coverage to those who were uninsured prior to ACA. However, this disproportionate demand may continue if young adults choose to purchase “bare-bones” insurance policies with high deductibles and limited catastrophic coverage. Our finding that those with full-year public insurance had significantly lower out-of-pocket expenses compared to those with full-year private coverage, despite similar levels of utilization suggests that public insurance provides better financial protection against rising costs and supports previous findings among children (27-30). How much of this financial protection will be preserved in the post-ACA period will depend on the degree of Medicaid expansion across the states.

Several other factors played important roles in utilization and expenditures for this age group, including the presence/absence of a usual source of care, sex, race/ethnicity and home language. Young adults with no usual source of care had lower overall utilization across all services, excepting ER and inpatient visits, than those with a usual source of care. As many young adults are using the health care system independently for the first time, higher rates of office-based visits for those with a usual source of care may suggest that a clinician or clinic (e.g. primary care provider) with whom young adults were familiar assisted them to achieve most of their medical needs on an outpatient basis. In contrast, those without a usual source of care may lack the care coordination and guidance by someone whom they trust and resulted in seeking care in the ER. It is less clear why those with and without a usual source have similar ER visit rates. This may suggest that there are additional barriers involving the ability to get to office-based visits even when young adults have a usual source of care, such as limited clinic hours, long wait-time for appointments, or lack of knowledge on how to access after-hour care (31-32).

The finding that females utilized care more than males even after adjusting for pregnancy status is consistent with previous studies in adolescents and young adults (33-34). It is likely associated, in part, with the high rates of reproductive health services used by young adult females (11, 33) and the lack of male-specific health specialty that serves young men (1, 35). Results showing lower utilization for minority young adults compared to white young adults replicate previous research for ambulatory care (11, 12), for doctor visits and dental care (5). Lower utilization rates for non-English speaking young adults may reflect a language barrier, lack of familiarity with using the health care system and differing perceptions of when it is appropriate to seek health care. The highest average expenditures among low-income young adults are likely explained by the highest rate of ER in this group even after adjusting for insurance and health status. The higher rates of utilization among

students than non-students may reflect 1) their usage of college health services and/or 2) their care utilization patterns being influenced by their parents if they are living at home (9).

There are several limitations to the study. The data used in this analysis are cross-sectional, which limits our ability to establish causality and may include recall-biases (36). While the MEPS permits estimation of nationally representative rates of health care utilization and expenditures, analyses of a specific age group that include further sub-setting of the data may lack the robustness that a larger data set would provide. Future analyses could benefit from pooling data from two or three years. The MEPS includes adults in households and their young adults in college, but excludes young adults in correctional institutions. The methodology of having the household respondent be the person with the most knowledge about the health care utilization of everyone in the household may pose a source of bias for all household members' responses other than the respondent. This may be particularly true in the case of young adults' survey responses regarding utilization or expenditure associated with confidential services that parents/caregivers may not be aware of. This could be improved by having individual household members provide their own survey responses, however, this strategy could result in a lower response rate with incomplete household level data. Additionally, variability in the validity of recall for certain types of visits may introduce bias into the results (37). Finally, the distribution of family income may not reflect the actual income of young adults as it was reported as income of the entire household.

Several ACA provisions provide financial incentives for young adults to access office-based over emergency care and may alleviate out-of-pocket expenses among the uninsured through insurance expansion: 1) dependent private insurance expansion to age 26; 2) Medicaid expansion; 3) state insurance exchanges; 4) individual and employer insurance mandates; and 5) bans on pre-existing condition (38). However, the extent of the effect will depend in part on the degree of implementation of the Medicaid expansion, the employer mandate, and the individual mandate (38). Whether young adults' out-of-pocket expenses will be lessened will depend on whether they have incentives to purchase insurance plans with minimal cost-sharing and comprehensive coverage vs. high cost-sharing and only catastrophic coverage. In addition to insurance expansion, the ACA also provides incentives to access preventive care by eliminating cost-sharing for well-exams and certain preventive services (21, 39). As a result, young adults' office-based visits may increase from having increased access to preventive care. To determine whether young adults' ER rates will be impacted by the ACA and whether some ER visits will be shifted to office-based visits, more in-depth research is needed to understand the reasons why young adults are seeking care in the ER and whether their conditions can be addressed by office-based visits. Further analysis of the degree of burden experienced among young adults due to out of pocket expenses could contribute a more detailed perspective on the impact of the ACA on the young adult population. The ACA provides new incentives for young adults to optimize their use of office-based over emergency care. A recent finding that adults newly enrolled in Medicaid insurance had higher ER visit use, in part for conditions that could be treated in primary care settings, suggests that additional incentives or facilitation may be necessary to encourage young adults to initiate appropriate use of primary care as opposed to ER care (40). The present findings not only provide the baseline data to track the impact of the ACA but also highlight the significance of young adults having a usual source of care to promote the use of office-



based over emergency care. Pediatricians have long-term relationships with their patients from childhood to young adulthood. While young adults gain health insurance coverage, pediatricians are in a unique position to help realize the full potential of the ACA by guiding young adults to access appropriate health care and to maintain a usual source of care through facilitating the transition from the pediatric to the adult medicine setting. Future health care and expenditures analyses of the young adult age group ages 18-25 years of age could help advance our understanding of the influence of the ACA on this population.

### Implications and Contribution

This study expands our understanding of young adults' health care utilization patterns and associated expenditures. It highlights the importance of addressing non-insurance factors in order to fully realize the potential of the ACA while young adults are gaining insurance coverage.

### Acknowledgments

**Funding Sources:** NICHD T32 training grant to the University of California, San Francisco Department of Pediatrics (T32 HD044331-10) and grants from the Maternal and Child Health Bureau, Health Resources and Services Administration, U.S. Department of Health and Human Services (U45MC 00002 and U45MC 00023). The authors thank the American Academy of Pediatrics for the opportunity to present an earlier version of this paper during the 2013 AAP Presidential Plenary & Annual Silverman Lecture at the Pediatric Academic Societies Annual Meeting. The authors appreciate the support provided by the UCSF National Adolescent and Young Adult Health Information Center: Dr. Paul W. Newacheck for his input on the conceptualization and critical review of the manuscript, and Dr. Elizabeth M. Ozer and Ms. Jane Park for their critical review of the manuscript.

### References

1. Irwin CE Jr. Young adults are worse off than adolescents. *J Adolesc Health*. 2010 May; 46(5):405–6. [PubMed: 20413074]
2. Ozer EM, Urquhart JT, Brindis CD, Park MJ, Irwin CE Jr. Young adult preventive health care guidelines: There but can't be found. *Arch Pediatr Adolesc Med*. 2012 Mar; 166(3):240–7. [PubMed: 22393182]
3. Washington, DC: Institute of Medicine of the National Academies; 2013. Workshop on improving the health, safety and well-being of young adults on May 7-8, 2013 [Internet]. [updated June 7, 2013; cited September 17, 2013]. Available from: <http://www.iom.edu/Activities/Children/ImprovingYoungAdultHealth/2013-MAY-07.aspx>
4. Park MJ, Brindis CD, Chang F, Irwin CE Jr. A midcourse review of the Healthy People 2010: 21 critical health objectives for adolescents and young adults. *J Adolesc Health*. 2008 Apr; 42(4):329–34. [PubMed: 18346657]
5. Mulye TP, Park MJ, Nelson CD, Adams SH, Irwin CE Jr, Brindis CD. Trends in adolescent and young adult health in the United States. *J Adolesc Health*. 2009 Jul; 45(1):8–24. [PubMed: 19541245]
6. Harris KM, Gordon-Larsen P, Chantala K, Udry JR. Longitudinal trends in race/ethnic disparities in leading health indicators from adolescence to young adulthood. *Arch Pediatr Adolesc Med*. 2006 Jan; 160(1):74–81. [PubMed: 16389215]
7. Park MJ, Adams SH, Irwin CE Jr. Health care services and the transition to young adulthood: Challenges and opportunities. *Acad Pediatr*. 2011 Mar-Apr; 11(2):115–22. [PubMed: 21296043]
8. Collins SR, Robertson R, Garber T, Doty MM. Young, uninsured, and in debt: Why young adults lack health insurance and how the Affordable Care Act is helping – findings from the Commonwealth Fund Health Insurance Tracking Survey. Commonwealth Fund. 2012
9. Collins SR, Nicholson JL. Realizing health reform's potential: Young adults and the Affordable Care Act of 2010. The Commonwealth Fund. 2010 Oct. 2010.

10. Nicholson JL, Collins SR, Mahato B, Gould E, Scheon C, Rustgi S. Rite of passage? why young adults become unisured and how new policies can help. 2009 Report No.: 64.
11. Fortuna RJ, Robbins BW, Halterman JS. Ambulatory care among young adults in the United States. *Ann Intern Med.* 2009 Sep 15; 151(6):379–85. [PubMed: 19755363]
12. Callahan ST, Cooper WO. Changes in ambulatory health care use during the transition to young adulthood. *J Adolesc Health.* 2010 May; 46(5):407–13. [PubMed: 20413075]
13. Lau JS, Adams SH, Irwin CE Jr, Ozer EM. Receipt of preventive health services in young adults. *J Adolesc Health.* 2013 Jan; 52(1):42–9. [PubMed: 23260833]
14. Callahan ST, Cooper WO. Uninsurance and health care access among young adults in the United States. *Pediatrics.* 2005 Jul; 116(1):88–95. [PubMed: 15995037]
15. Pitts, SR.; Niska, RW.; Xu, JX. National Health Statistics Reports. Center for Disease Control and Prevention; Aug 6. 2008 National Hospital Ambulatory Medical Care Survey: 2006 emergency department summary. Report No.: n. 7
16. Schappert, SM.; R, E. Vital Health Stat. Vol. 13. Washington, DC: National Center for Health Statistics; 2011. Ambulatory medical care utilization estimates for 2007. Report No
17. Machlin, S.; Kress, M. Trends in health care expenditure for adults 18-44: 2006 versus 1996. Rockville, MD: Agency for Healthcare Research and Quality; Aug. 2009 Report No.: Statistical Brief #254
18. Sommers, BD.; Schwartz, K. 2.5 million young adults gain health insurance due to the Affordable Care Act. Office of the Assistant Secretary for Planning and Evaluation, Department of Health and Human Services; 2011.
19. English, A.; PM. The Supreme Court ACA decision: What happens now for adolescents and young adults?. Chapel Hill, NC and San Francisco, CA: Center for Adolescent Health & the Law and National Adolescent and Young Adult Health Information Center; 2012.
20. English, A. The Patient Protection and Affordable Care Act of 2010: How does it help adolescents and young adults. Center for Adolescent Health and the Law. National Adolescent Health Information and Innovation Center; 2010 Aug. Internet2010
21. Koh HK, Sebelius KG. Promoting prevention through the Affordable Care Act. *N Engl J Med.* 2010 Sep 30; 363(14):1296–9. [PubMed: 20879876]
22. MEPS HC-129 2009 full year consolidated data file documentation. Rockville, MD: Agency for Healthcare Research and Quality Center for Financing, Access, and Cost Trends; 2011. InternetAvailable from: [http://meps.ahrq.gov/mepsweb/data\\_stats/download\\_data/pufs/h129/h129doc.shtml](http://meps.ahrq.gov/mepsweb/data_stats/download_data/pufs/h129/h129doc.shtml)
23. Diehr P, Yanez D, Ash A, Hornbrook M, Lin DY. Methods for analyzing health care utilization and costs. *Annu Rev Public Health.* 1999; 20:125–44. [PubMed: 10352853]
24. Williams R. Using the margins command to estimate and interpret adjusted predictions and marginal effects. *Stata Journal.* 2012; 2:308–331.
25. Hsia RY, Kellermann AL, Shen YC. Factors associated with closures of emergency departments in the United States. *JAMA.* 2011 May 18; 305(19):1978–85. [PubMed: 21586713]
26. Mulcahy A, Harris K, Finegold K, Kellermann A, Edelman L, Sommers BD. Insurance coverage of emergency care for young adults under health reform. *N Engl J Med.* 2013 May 30; 368(22):2105–12. [PubMed: 23718165]
27. Yu H, Dick AW, Szilagyi PG. Does public insurance provide better financial protection against rising health care costs for families of children with special health care needs? *Med Care.* 2008 Oct; 46(10):1064–70. [PubMed: 18815528]
28. Galbraith AA, Wong ST, Kim SE, Newacheck PW. Out-of-pocket financial burden for low-income families with children: Socioeconomic disparities and effects of insurance. *Health Serv Res.* 2005 Dec; 40(6 Pt 1):1722–36. [PubMed: 16336545]
29. Newacheck PW, Wong ST, Galbraith AA, Hung YY. Adolescent health care expenditures: A descriptive profile. *J Adolesc Health.* 2003 Jun; 32(6 Suppl):3–11. [PubMed: 12782440]
30. Newacheck PW, Pearl M, Hughes DC, Halfon N. The role of Medicaid in ensuring children's access to care. *JAMA.* 1998 Nov 25; 280(20):1789–93. [PubMed: 9842958]

31. Rust G, Ye J, Baltrus P, Daniels E, Adesunloye B, Fryer GE. Practical barriers to timely primary care access: Impact on adult use of emergency department services. *Arch Intern Med*. 2008 Aug 11; 168(15):1705–10. [PubMed: 18695087]
32. Wilson KM, Klein JD. Adolescents who use the emergency department as their usual source of care. *Arch Pediatr Adolesc Med*. 2000 Apr; 154(4):361–5. [PubMed: 10768673]
33. Cylus J, Hartman M, Washington B, Andrews K, Catlin A. Pronounced gender and age differences are evident in personal health care spending per person. *Health Aff (Millwood)*. 2011 Jan; 30(1): 153–60. [PubMed: 21148180]
34. Adams SH, Husting S, Zahnd E, Ozer EM. Adolescent preventive services: Rates and disparities in preventive health topics covered during routine medical care in a California sample. *J Adolesc Health*. 2009 Jun; 44(6):536–45. [PubMed: 19465317]
35. Marcell AV, Klein JD, Fischer I, Allan MJ, Kokotailo PK. Male adolescent use of health care services: Where are the boys? *J Adolesc Health*. 2002 Jan; 30(1):35–43. [PubMed: 11755799]
36. Kimberlin CL, Winterstein AG. Validity and reliability of measurement instruments used in research. *Am J Health Syst Pharm*. 2008 Dec 1; 65(23):2276–84. [PubMed: 19020196]
37. Zuvekas SH, Olin. Validating household reports of health care use in the Medical Expenditure Panel Survey. *Health services research*. 2009; 44(5):1679–1700. [PubMed: 19619249]
38. Kaiser family foundation website. Health reform. Menlo Park, CA: Kaiser Family Foundation; 2013. Internet[updated 9/17/2013; cited 9/1/13]. Available from: <http://kff.org/health-reform/>
39. Washington D.C.: U.S. Department of Health & Human Services; U.S department of health & human services strategic plan [Internet]. cited January 18, 2013]. Available from: <http://www.hhs.gov/secretary/about/goal1.html>
40. Taubman SL. Medicaid increases emergency-department use: evidence from Oregon's Health Insurance Experiment. *Science*. 2009; 343(6168):263–268. [PubMed: 24385603]

## Abbreviations

<b>ACA</b>	Affordable Care Act
<b>STIs</b>	sexually-transmitted infections
<b>FPL</b>	Federal poverty level
<b>MEPS</b>	Medical Expenditure Panel Survey

**Table 1**  
**Demographic and access characteristics of young adults between the ages of 18-25 who participated in the MEPS 2009 (n=3768; population est. = 33,635,658)**

<b>Sex</b>	
Female	49%
Male	51%
<b>Race/ethnicity</b>	
Non-Hispanic White	60%
Non-Hispanic Black	14%
Non-Hispanic Asian	5%
Hispanic	18%
American Indian/Alaskan	1%
Hawaiian/Pacific Islander	0%
Multi-racial	2%
<b>Poverty Status</b>	
>=400% FPL	30%
200-399% FPL	30%
100-199% FPL	21%
<100% FPL	19%
<b>Home language</b>	
English	86%
Non-English	14%
<b>Education</b>	
>12 years	77%
<12 years	23%
<b>Student</b>	
Student (full-time or part-time)	52%
Not a student	48%
<b>Employment status</b>	
Employed	64%
Unemployed	36%
<b>Insurance Status</b>	
Full-year private (exclude combined private + public)	43%
Full-year public (exclude combined private + public)	9%
Partial-year uninsured (public/private/combined private and public)	21%
Full-year uninsured	27%
Full-year combined private + public	0.3%
<b>Usual source of care</b>	
Yes	59%
No	41%

Table 2

Past year health care utilization rates and expenditures (adolescent's and young adults' rates and expenditures adjusted for pregnancy) by age group: 2009 MEPS.

	Children (age 0-11) n=6784, pop est=50,259,173	Adolescents (age 12-17) n=3301, pop est=24,528,280	Young Adults <sup>§</sup> (age 18-25) n=3768, pop est=33,635,658
<b>Utilization</b>			
% had any health care utilization	88% <sup>***</sup>	83% <sup>***</sup>	72%
<b>Office-based visits</b>			
% had visit(s)	77% <sup>***</sup>	67% <sup>***</sup>	55%
<b>Hospital outpatient visits</b>			
% had visit(s)	7%	5% <sup>*</sup>	7%
<b>ER visits</b>			
% had visit(s)	15%	12% <sup>**</sup>	15%
<b>Inpatient hospitalizations</b>			
% had visit(s)	2% <sup>***</sup>	4% <sup>*</sup>	5%
<b>Prescription medications</b>			
% had prescription(s)	50%	49%	48%
<b>Dental visits</b>			
% had visit(s)	44% <sup>***</sup>	53% <sup>***</sup>	34%
<b>Expenditures per capita (in dollars) (SE)</b>			
Average healthcare expenditures	1506 (138) <sup>*</sup>	1905 (104)	1935 (134)
Average out of pocket expenditures	195 (13) <sup>***</sup>	369 (27)	334 (24)
% of OOP/Total HC expenditures	13% (10-16%) <sup>**</sup>	20% (17-23%)	17% (15-20%)
<b>Expenditures among those who incurred expenditures (in dollars) (SE)</b>			
Average healthcare expenditures	1719 (155) <sup>*</sup>	2490 (158)	2560 (176)
Average out of pocket expenditures	223 (14) <sup>***</sup>	445 (3)	458 (32)

\* p&lt;0.05

\*\* p&lt;0.01

\*\*\*  
p<0.001

<sup>s</sup>Referent group

Bold = statistically significantly from the reference group

**Table 3**  
**Disparities of overall utilization rates and expenditures among young adults (controlled for all covariates, health status, and pregnancy status): 2009 MEPS**

	adjusted %had utilization	aOR (95% CI)	Overall Expenditures <sup>o</sup>	
			Average expense/person	Average OOP expense/person
Subpopulation size (n = 2783; population estimate = 24,481,205)				
<b>Young adult overall</b>	72%			
<b>Sex</b>				
Male <sup>§</sup>	66%		1370 (1108-1632)	246 (192-300)
Female	82%	<b>2.77 (2.17-3.55)***</b>	<b>2099 (1769-2429)***</b>	<b>379 (318-440)***</b>
<b>Race/ethnicity</b>				
White <sup>§</sup>	78%		2098 (1734-2461)	381 (313-448)
Black	64%	<b>0.44 (0.33-0.58)***</b>	<b>1139 (974-1824)*</b>	<b>149 (105-193)***</b>
Asian	72%	0.67 (0.41-1.12)	<b>987 (586-1388)*</b>	<b>156 (102-209)***</b>
Hispanic	67%	<b>0.53 (0.37-0.76)**</b>	<b>1374 (998-1750)*</b>	<b>224 (157-291)**</b>
<b>Poverty Status<sup>  </sup></b>				
>=400% FPL <sup>§</sup>	74%		1687 (1312-2063)	380 (295-465)
200-399% FPL	70%	0.81 (0.55-1.20)	1314 (1070-1557)	<b>204 (170-239)***</b>
100-199% FPL	74%	1.05 (0.69-1.59)	1557 (1166-1949)	283 (215-352)
<100% FPL	76%	1.20 (0.89-1.95)	<b>2860 (1876-3845)**</b>	403 (256-550)
<b>Home language</b>				
English <sup>§</sup>	75%		1880 (1632-2129)	311 (270-352)
non-English	65%	<b>0.53 (0.38-0.76)***</b>	<b>1088 (592-1583)*</b>	340 (134-546)
<b>Education</b>				
>12years <sup>§</sup>	75%		1952 (1632-2271)	337 (288-385)
<12 years	72%	0.84 (0.64-1.08)	1590 (1184-1996)	268 (189-348)
<b>Student status</b>				
Student <sup>§</sup>	77%		1674 (1405-1944)	286 (242-329)
Non-Student	69%	<b>0.64 (0.50-0.81)***</b>	1988 (1622-2354)	360 (286-434)

	adjusted % had utilization	aOR (95% CI)	Overall Expenditures <sup>c</sup>	
			Average expense/person	Average OOP expense/person
<b>Employment status</b>				
Employed <sup>§</sup>	74%		1762 (1402-2122)	308 (247-369)
Unemployed	72%	0.88 (0.68-1.15)	1859 (1524-2195)	322 (260-384)
<b>Insurance Status</b>				
Full-year private (exclude combined private + public) <sup>§</sup>	81%		2150 (1738-2562)	380 (295-465)
Full-year public (exclude combined private + public)	76%	0.70 (0.47-1.05)	2293 (1456-3129)	<b>204 (169-239)***</b>
Partial-year uninsured (public/private)	74%	<b>0.62 (0.42-0.90)*</b>	<b>1459 (1129-1788)*</b>	<b>283 (215-352)**</b>
Full-year uninsured	60%	<b>0.29 (0.20-0.41)***</b>	<b>1040 (706-1373)***</b>	403 (256-550)
<b>Usual source of care</b>				
Yes <sup>§</sup>	77%		2017 (1722-2312)	331 (279-383)
No	68%	<b>0.58 (0.46-0.75)***</b>	<b>1383 (1101-1665)**</b>	278 (216-339)
<b>Health Status</b>				
Excellent <sup>§</sup>	71%		1519 (1218-1821)	291 (230-351)
Very good	74%	1.19 (0.92-1.56)	1449 (1133-1765)	312 (251-374)
Good	77%	<b>1.54 (1.11-2.15)*</b>	2339 (1790-2888)†	329 (250-407)
Fair	81%	2.10 (0.97-4.52)	3707 (1722-5692)†	495 (229-761)
Poor	72%	1.07 (0.17-6.57)	<b>6447 (1756-11138)***</b>	317 (21-655)
<b>Pregnancy Status</b>				
No <sup>§</sup>	73%		1531 (1321-1742)	306 (262-351)
Yes	95%	<b>9.60 (4.11-22.43)***</b>	<b>7497 (5359-9634)***</b>	<b>499 (316-682)**</b>



**Table 4**  
**Disparities of different types of utilization among young adults (controlled for all covariates, health status, and pregnancy status): 2009 MEPS**

	Office-based		Hospital outpatient		Emergency room		Inpatient hospitalization		Prescription medication		Dental	
	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)
Subpopulation size (n=2674; population estimate = 23,599,688)												
<b>Young adult overall</b>												
<b>Sex</b>												
Male <sup>§</sup>	47%		6%		13%		4%		38%		32%	
Female	67%	<b>2.61 (2.08-3.27)***</b>	8%	1.45 (0.92-2.27)	17%	1.34 (0.99-1.82)	6%	<b>2.02 (1.27-3.22)**</b>	59%	<b>2.63 (2.09-3.33)***</b>	37%	1.27 (1.00-1.62)
<b>Race/ethnicity</b>												
White <sup>§</sup>	61%		7%		16%		6%		53%		38%	
Black	46%	<b>0.45 (0.34-0.59)***</b>	6%	0.80 (0.50-1.26)	17%	1.04 (0.77-1.40)	7%	1.34 (0.78-2.29)	36%	<b>0.45 (0.35-0.59)***</b>	23%	<b>0.43 (0.32-0.59)***</b>
Asian	53%	0.67 (0.39-1.16)	6%	0.75 (0.29-1.95)	4%	0.20 (0.08-0.48)†	5%	0.75 (0.30-1.85)	33%	<b>0.38 (0.24-0.59)***</b>	37%	0.96 (0.61-1.52)
Hispanic	49%	<b>0.54 (0.38-0.77)**</b>	8%	1.10 (0.64-1.88)	11%	<b>0.59 (0.38-0.90)*</b>	4%	0.62 (0.31-1.25)	46%	0.74 (0.53-1.02)	30%	<b>0.64 (0.45-0.91)*</b>
<b>Poverty Status¶</b>												
>=400% FPL <sup>§</sup>	58%		7%		13%		4%		47%		37%	
200-399% FPL	54%	0.79 (0.59-1.06)	7%	1.10 (0.66-1.85)	13%	1.04 (0.66-1.64)	5%	1.53 (0.62-3.77)	45%	0.89 (0.65-1.24)	32%	0.77 (0.55-1.08)
100-199% FPL	57%	0.91 (0.66-1.26)	7%	1.07 (0.58-1.96)	15%	1.16 (0.73-1.83)	5%	1.53 (0.66-3.54)	50%	1.16 (0.82-1.64)	28%	<b>0.62 (0.41-0.94)*</b>
<100% FPL	59%	1.02 (0.70-1.47)	8%	1.13 (0.56-2.25)	21%	<b>1.81 (1.14-2.88)*</b>	8%	2.87 (1.12-7.32)†	53%	1.35 (0.95-1.91)	40%	1.15 (0.77-1.70)
<b>Home language</b>												
English <sup>§</sup>	58%		7%		16%		6%		51%		35%	
non-English	48%	<b>0.60 (0.42-0.85)**</b>	6%	0.75 (0.39-1.45)	10%	<b>0.55 (0.33-0.91)*</b>	5%	0.79 (0.42-1.50)	31%	<b>0.39 (0.27-0.56)***</b>	28%	0.67 (0.44-1.01)
<b>Education</b>												
>12years <sup>§</sup>	57%		7%		15%		6%		48%		37%	
<12 years	56%	0.90 (0.69-1.18)	7%	0.95 (0.61-1.48)	15%	1.01 (0.72-1.42)	5%	0.89 (0.56-1.42)	48%	1.00 (0.77-1.230)	30%	<b>0.68 (0.50-0.93)*</b>
<b>Student status</b>												
Student <sup>†</sup>	60%		8%		14%		5%		50%		39%	
Non-Student	52%	<b>0.66 (0.51-0.85)**</b>	6%	0.69 (0.45-1.06)	17%	1.28 (0.91-1.80)	6%	1.16 (0.65-2.07)	46%	0.85 (0.67-1.07)	28%	<b>0.56 (0.45-0.69)***</b>
<b>Employment status</b>												
Employed <sup>§</sup>	59%		7%		15%		5%		50%		35%	

	Office-based		Hospital outpatient		Emergency room		Inpatient hospitalization		Prescription medication		Dental	
	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)	adjusted % had visit	aOR (95% CI)
Unemployed	54%	<b>0.77 (0.60-0.99)*</b>	7%	0.91 (0.53-1.58)	15%	1.03 (0.72-1.47)	6%	1.13 (0.60-2.14)	47%	0.86 (0.68-1.09)	34%	0.96 (0.76-1.23)
<b>Insurance Status</b>												
Full-year private (exclude combined private + public) <sup>§</sup>	62%		8%		13%		7%		52%		45%	
Full-year public (exclude combined private + public)	64%	1.08 (0.71-1.63)	10%	1.33 (0.69-2.57)	16%	1.35 (0.85-2.14)	6%	0.96 (0.44-2.07)	57%	1.27 (0.88-1.84)	30%	<b>0.51 (0.33-0.79)**</b>
Partial-year uninsured (public/private)	55%	<b>0.72 (0.52-1.00)*</b>	7%	0.88 (0.46-1.69)	19%	<b>1.73 (1.14-2.63)*</b>	4%	<b>0.49 (0.26-0.92)*</b>	48%	0.83 (0.59-1.17)	31%	<b>0.53 (0.38-0.74)***</b>
Full-year uninsured	45%	<b>0.44 (0.32-0.61)***</b>	3%	0.34 (0.18-0.63)†	14%	1.16 (0.79-1.69)	4%	<b>0.50 (0.27-0.93)*</b>	37%	<b>0.49 (0.35-0.69)***</b>	17%	<b>0.23 (0.16-0.32)***</b>
<b>Usual source of care</b>												
Yes <sup>§</sup>	62%		9%		15%		6%		52%		37%	
No	48%	<b>0.49 (0.40-0.61)***</b>	4%	<b>0.43 (0.28-0.67)***</b>	16%	1.13 (0.83-1.54)	5%	0.86 (0.56-1.33)	42%	<b>0.64 (0.52-0.79)***</b>	30%	<b>0.72 (0.55-0.93)**</b>
<b>Health Status</b>												
Excellent <sup>§</sup>	53%		7%		13%		5%		42%		36%	
Very good	59%	<b>1.40 (1.12-1.75)**</b>	5%	0.75 (0.451.26)	13%	0.04 (0.68-1.32)	5%	1.07 (0.53-2.17)	50%	<b>1.48 (1.12-1.97)**</b>	34%	0.89 (0.68-1.17)
Good	61%	<b>1.53 (1.14-2.06)**</b>	9%	1.34 (0.81-2.23)	19%	<b>1.56 (1.06-2.30)*</b>	7%	1.74 (0.89-3.39)	56%	<b>2.00 (1.54-2.61)***</b>	31%	0.76 (0.55-1.05)
Fair	65%	<b>1.90 (1.05-3.46)*</b>	14%	2.35 (1.03-5.34)†	28%	<b>2.62 (1.151-4.56)**</b>	8%	2.28 (0.79-6.60)	65%	<b>3.11 (1.71-5.66)***</b>	38%	1.12 (0.66-1.91)
Poor	66%	1.98 (0.39-10.13)	18%	3.07 (0.76-12.40)	33%	3.51 (1.00-12.31)	20%	8.43 (2.28-31.16)†	64%	2.97 (0.74-11.91)	29%	0.70 (0.20-2.48)
<b>Pregnancy Status</b>												
No <sup>§</sup>	56%		7%		15%		3%		48%		34%	
Yes	83%	<b>5.08 (2.55-10.13)***</b>	17%	3.01 (1.40-6.52)†	23%	<b>1.76 (1.01-3.05)*</b>	60%	61.48 (32.01-118.06)†	60%	1.81 (0.94-3.48)	43%	1.57 (0.99-2.49)