Volume Title: Economics of Means-Tested Transfer Programs in the United States, Volume 1

Volume Author/Editor: Robert A. Moffitt, editor

Volume Publisher: University of Chicago Press

Volume ISBNs: 0-226-37047-X , 978-0-226-37047-7 (cloth)

Volume URL: http://www.nber.org/books/moff14-1

Conference Dates: December 5–6, 2014

Publication Date: November 2016

Chapter Title: The Medicaid Program

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Chapter URL: http://www.nber.org/chapters/c13486

Chapter pages in book: (p. 21 – 136)

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The Medicaid Program

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1.1 Introduction

In both its costs and the number of its enrollees, Medicaid is the largest means-tested transfer program in the United States. It is also a fundamental part of the health care system, providing health insurance to low-income families, indigent seniors, and disabled adults. In 2011, Medicaid covered over 68 million individuals at a cost to state and federal governments of nearly $400 billion (Centers for Medicare and Medicaid Services [CMS] 2013a). Federal Medicaid expenditures, which historically have averaged between 50 and 60 percent of total program expenditures, represent about 8 percent of the federal budget and nearly 2 percent of gross domestic product (Congressional Budget Office 2014). In 2012, the median state spent 22.4 percent of its budget on Medicaid (National Association of State Budget Officers 2013).

Because it finances different types of services for different groups of beneficiaries, it is often noted that Medicaid is essentially four public insurance programs in one (Gruber 2003). First, Medicaid is the primary source of

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This chapter was prepared for the conference and volume *Economics of Means-Tested Transfer Programs in the United States*, vol. 1, organized and edited by Robert Moffitt. We are grateful to Morgan Henderson, Yuvraj Singh, and Ken Ueda for excellent research assistance and to our discussant Amy Finkelstein and other conference participants for helpful comments. For acknowledgments, sources of research support, and disclosure of the authors' material financial relationships, if any, please see http://www.nber.org/chapters/c13486.ack.

health insurance for low-income children and parents, providing coverage for a full range of outpatient and inpatient services. Second, Medicaid provides complementary insurance for low-income seniors for whom Medicare is the primary source of insurance. Third, Medicaid covers the medical expenses of low-income disabled individuals. Fourth, Medicaid is the largest source of financing for nursing home care. In addition to differences related to the characteristics and needs of different beneficiary groups, there is considerable heterogeneity across states. Although the federal government establishes important standards, states have considerable flexibility in terms of eligibility rules, the method and level of provider payment and, to a lesser extent, program benefits. Thus, it is also often argued that Medicaid is not one program, but fifty-one.

Expanded eligibility for Medicaid is a critical component of the Patient Protection and Affordable Care Act of 2010 and the Health Care and Education Reconciliation Act of 2010—together known as the Affordable Care Act (ACA). Initial projections were that roughly half of all individuals who gain insurance coverage as a result of the ACA would be enrolled in Medicaid. By establishing a new federal income standard, it was expected that the ACA would significantly reduce the variation across states in eligibility rules. However, because of the 2012 Supreme Court ruling that essentially made the ACA Medicaid expansions voluntary to states, implementation of the ACA has reduced variation in eligibility rules among expansion states while accentuating differences between states that have and have not elected to expand their programs. A number of expansion states have received waivers from the federal government allowing them to innovate on a number of dimensions. Thus, the ACA has continued not only the growth of Medicaid in terms of enrollment and expenditures, but it has contributed to the increased complexity of the program.

The ACA represents a significant inflection point for the Medicaid program, with important implications for the US health care system and for economic research on the program. The ACA eligibility expansions not only increase Medicaid enrollment and spending, but they also accelerate changes in the characteristics of individuals served by the program. As we describe below, at its inception, Medicaid eligibility was closely linked to the receipt of cash welfare benefits. Over time, this link was loosened and Medicaid eligibility limits were increased substantially for children, and to a lesser extent their parents. These expansions led to voluminous research literatures on the impact of Medicaid on a broad range of outcomes. The literature on how Medicaid affects access to care and health outcomes, especially for children, is particularly large. Multiple studies that we review in this chapter (and many more that we are not able to include) provide strong evidence that Medicaid significantly improves access to care. Several studies also suggest that this increased care leads to better health outcomes, including a reduction in infant and child mortality. The ACA eligibility expansions

will largely affect nondisabled, nonelderly childless adults, a demographic group that has been underrepresented in the program. Although there has been less research on the impact of Medicaid on this population, several important studies have been published recently. The most notable are based on the randomized assignment of Medicaid eligibility in Oregon. Research based on the Oregon experiment confirms a number of results from the prior literature, such as a strong effect of Medicaid on health care utilization, while also providing evidence on other outcomes, such as financial well-being, that had previously received limited attention.

This chapter reviews the history and structure of the Medicaid program and the large body of economic research that it has spawned in the nearly half century since it was established. Section 1.2 summarizes the program's history, goals, and current rules and section 1.3 presents program statistics, mainly related to enrollment and expenditures. Then we turn to the research on the impact of Medicaid. In section 1.4 we discuss theoretical and methodological issues important for understanding these effects. Section 1.5 reviews the empirical literature, describing what has been learned thus far, investigating areas where studies seem to reach different conclusions and pointing to areas where we believe additional research would be fruitful. Section 1.6 concludes.

1.2 Program History, Goals, and Current Rules

Founded in 1965 as Title XIX of the Social Security Amendments, Medicaid is a joint state-federal program. The federal government provides the majority of the program's funding and establishes general guidelines for eligibility, services to be covered, and reimbursement rates; states provide additional funding and have some flexibility in how they administer the program in terms of eligibility levels and procedures, benefits, provider payments, and care delivery approaches. Over its fifty-year history, the program has undergone many changes and modifications, although there are characteristics of Medicaid that were present at its inception and remain important in the program today. One of these is the existence of both mandatory actions that states *must* take—groups of individuals that states must cover and services that states must provide—and optional actions that states *may* take. As a result, the program differs substantially across states with respect to eligibility, covered services, and provider reimbursement rates.

While some fundamental features of Medicaid have remained constant throughout its history, there is one key element of Medicaid that has changed in recent years. From its inception, Medicaid was available only for individuals who were actual or potential recipients of cash assistance, resulting in a means-tested program that was unavailable to large portions of the poor population. In particular, only the elderly, the disabled, or members of families with dependent children where one parent is absent, incapacitated,

or unemployed (the latter only in some states) could be eligible for Medicaid. The requirement for membership in one of these groups began to be relaxed beginning with the Deficit Reduction Act of 1984, but not until the ACA was implemented was eligibility for Medicaid extended more broadly to low-income adults who were not elderly, disabled, or parents of a dependent child. The ACA thus represents both a continuation of the program as it has existed and a fundamental shift.

The history of the program can be divided into three main periods.[1] First is the period between 1965 and the early 1980s, when the program was characterized by strict limits on eligibility that were not solely income based. Since many of the features of the program established at its enactment survive in some form today, in discussing this period we also lay out the basic structure of eligibility for the program, services covered, and the structure of reimbursement. Second is the period between the early 1980s and prior to the passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), when definitions of eligibility began to expand, although the primary route to Medicaid eligibility remained eligibility for cash assistance. In our discussion of this period we focus primarily on the incremental changes that were occurring with eligibility. Finally, there is the period beginning with the passage of PRWORA and culminating with the implementation of the ACA. During this time there were major changes in the program that resulted in the rules in place today.

We summarize the major legislative actions affecting Medicaid in table 1.1. From these legislative actions it can be seen that Medicaid is a program of fundamental tensions: between a recognition that many poor individuals lack health insurance, resulting in a desire for expanded eligibility, and concern about substantial and growing costs of the program; between a desire to compensate providers at sufficiently high levels to ensure participation and a desire to contain costs by capping provider compensation; and between giving states flexibility to design their own programs and ensuring uniform standards across the country. In addition to legislative action, Medicaid has been shaped in important ways by federal regulatory decisions and state choices. Below we discuss these important policy elements as well.

1.2.1 Implementation and Adaptation: 1965–1983

The establishment of Medicaid in 1965 grew out of earlier medical care vendor-payment programs that were linked to cash assistance receipt. These earlier programs, established by the Social Security Amendments of 1950 and expanded by the Kerr-Mills Act of 1960, had the fundamental feature continued in Medicaid of providing federal funding at state option for

1. Sources for this section include Congressional Research Service (1993), Gruber (2003), Schneider et al. (2002), Schneider (1997), Congressional Budget Office (2001), Urban Institute (2015), Kaiser Family Foundation (2008), US Social Security Administration (2011), Office of the Legislative Counsel (2010), Kaiser Commission on Medicaid and the Uninsured (2009), and Centers for Medicare & Medicaid Services (CMS 2013b).

Table 1.1 Major Medicaid and CHIP legislation, 1965 to 2010

Social Security Amendments of 1965	Established the Medicaid program.
Social Security Amendments of 1967	Enacted the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) benefit, required for Medicaid children younger than twenty-one. Allowed states to extend Medicaid coverage to optional populations not receiving cash assistance, including "Ribicoff children"—individuals under twenty-one who would be eligible for AFDC if they met the definition of dependent child. Permitted Medicaid beneficiaries to use providers of their choice. Limited income eligibility standard for medically needy.
Act of 14 December 1971	Allowed states to cover services in intermediate care facilities for individuals with lower-level care needs than skilled nursing facilities.
Social Security Amendments of 1972	Enacted Supplemental Security Income (SSI) program for elderly and disabled and required states to extend Medicaid to SSI recipients or to elderly and disabled meeting state 1972 eligibility criteria ("209[b]" option). Repealed the Medicaid "maintenance of effort" requirement for states. Allowed states to cover care for beneficiaries under age twenty-two in psychiatric hospitals.
Medicare-Medicaid Anti-Fraud and Abuse Amendments of 1977	Established Medicaid Fraud Control Units.
Departments of Labor and Health, Education, and Welfare Appropriations Act for FY 1977	Enacted the Hyde Amendment, which prohibited federal Medicaid payments for medically necessary abortions except when the life of the mother would be endangered.
Mental Health Systems Act of 1980	Required most states to develop a computerized Medicaid management information system.
Omnibus Reconciliation Act of 1980 (OBRA 1980)	Enacted the Boren Amendment requiring states to pay "reasonable and adequate" rates for nursing home services instead of Medicare reimbursement rates.
Omnibus Budget Reconciliation Act of 1981 (OBRA 1981)	Enacted reduction in federal-matching percentages applicable from FY 1982–1984. Extended Boren Amendment payment standard to inpatient hospital services. Required states to make payment adjustments to hospitals serving a disproportionate share of Medicaid and low-income patients (DSH hospitals). Enacted section 1915(b) freedom-of-choice waiver for mandatory managed care. Enacted section 1915(c) home and community-based waiver. Eliminated special penalties for noncompliance with EPSDT requirements. Gave states with medically needy programs broader authority to limit coverage.

(*continued*)

Table 1.1 (continued)

Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA)	Allowed states to impose nominal cost sharing on certain Medicaid beneficiaries and services.
Deficit Reduction Act of 1984 (DEFRA)	Required states to cover children born after September 30, 1983, up to age five in families meeting state AFDC income and resource standards. Required states to cover first-time pregnant women and pregnant women in two-parent unemployed families meeting state AFDC income and resource standards.
Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA)	Required states to cover pregnant women in two-parent families (whether or not unemployed) meeting state AFDC income and resource standards.
Omnibus Reconciliation Act of 1986 (OBRA 1986)	Allowed states to cover pregnant women and young children up to age five in families with incomes at or below 100 percent of federal poverty level. Allowed states to pay for Medicare premiums and cost sharing for low-income Medicare beneficiaries (QMBs) with incomes at or below 100 percent of federal poverty level. Mandated coverage of emergency services for illegal immigrants who would otherwise be eligible for Medicaid.
Medicare and Medicaid Patient and Program Protection Act of 1987	Strengthened authorities to sanction and exclude providers.
Omnibus Budget Reconciliation Act of 1987 (OBRA 1987)	Allowed states to cover pregnant women and infants in families with incomes at or below 185 percent of federal poverty level. Allowed states to cover children up to age eight in families below 100 percent of poverty level. Enacted nursing home reform provisions that phased out distinction between skilled nursing facilities and intermediate care facilities, upgraded quality of care requirements, and revised monitoring and enforcement. Strengthened OBRA 1981 requirements that states provide additional payment to hospitals treating a disproportionate share of low-income patients.
Medicare Catastrophic Coverage Act of 1988 (MCCA)	Required states to phase in coverage for pregnant women and infants with incomes below 100 percent of federal poverty level. Required states to phase in coverage of Medicare premiums and cost sharing for low-income Medicare beneficiaries (QMBs) with incomes below 100 percent of poverty level. Established minimum income and resource rules for nursing home residents whose spouses remain in the community to prevent "spousal impoverishment."

Family Support Act of 1988 (FSA)	Required states to extend twelve months transitional Medicaid coverage to families leaving AFDC rolls due to earnings from work. Required states to cover two-parent unemployed families meeting state AFDC income and resource standards.
Omnibus Budget Reconciliation Act of 1989 (OBRA 1989)	Required states to cover pregnant women and children under age six in families with incomes at or below 133 percent of federal poverty level. Expanded EPSDT benefit for children under twenty-one to include diagnostic and treatment services not covered under state Medicaid program for adult beneficiaries. Required states to cover services provided by federally qualified health centers.
Omnibus Budget Reconciliation Act of 1990 (OBRA 1990)	Required states to phase in coverage of children ages six through eighteen born after September 30, 1983, in families with incomes at or below 100 percent of federal poverty level. Required states to phase in coverage of Medicare premiums for low-income Medicare beneficiaries with incomes between 100 and 120 percent of federal poverty level (SLMB). Required manufacturers to give "best price" rebates to states and federal government for outpatient prescription drugs covered under Medicaid program.
Medicaid Voluntary Contribution and Provider-Specific Tax Amendments of 1991	Restricted use of provider donations and taxes as state share of Medicaid spending. Imposed ceiling on Medicaid payment adjustments to DSH hospitals (12 percent of national aggregate Medicaid spending).
Omnibus Budget Reconciliation Act of 1993 (OBRA 1993)	Established standards for state use of formularies to limit prescription drug coverage. Imposed facility-specific ceilings on the amount of payment adjustment to DSH hospitals. Tightened prohibitions against transfers of assets in order to qualify for Medicaid nursing home coverage; required recovery of nursing home payments from beneficiary estates. Established Vaccines for Children (VFC) program providing federally purchased vaccines to states.
Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA)	Replaced AFDC with Temporary Assistance for Needy Families (TANF) and severed the automatic link between cash welfare and Medicaid. Mandated coverage of families meeting AFDC eligibility standards as of July 16, 1996, while permitting coverage of higher-income families. Prohibited Medicaid coverage for legal immigrants entering the United States after August 21, 1996, and allowed states to cover these immigrants after they have been in the country for five years. Narrowed the eligibility criteria for disabled children.

(*continued*)

Table 1.1 (continued)

Balanced Budget Act of 1997 (BBA 1997)	Created the State Children's Health Insurance Program (SCHIP, later referred to as CHIP), allowing states to cover uninsured children in families with incomes below 200 percent of FPL who were ineligible for Medicaid. Allowed states to implement mandatory managed-care enrollment for most Medicaid beneficiaries without obtaining section 1915(b) waivers. Eliminated minimum payment standards for state-set reimbursement rates for hospitals, nursing homes, and community health centers, placed ceilings on DSH payment adjustments, and allowed states to shift the cost of Medicare deductibles and coinsurance requirements for low-income Medicare beneficiaries from their Medicaid programs to physicians and other providers. Allowed partial coverage of Medicare premiums for beneficiaries with incomes between 120 and 135 percent of FPL (QIs), funded via a federal block grant. Restored Medicaid eligibility for legal immigrants who entered the country on or before August 22, 1996, and became disabled and qualified for Supplemental Security Income (SSI) benefits thereafter. Restored Medicaid coverage for certain disabled children who would lose their eligibility as a result of PRWORA. Allowed states to provide up to twelve months of continuous eligibility for children. Allowed states to cover children presumptively until a formal determination of eligibility is made.
Ticket to Work and Work Incentives Improvement Act of 1999	Allowed states to cover working disabled individuals with incomes above 250 percent of federal poverty level and impose income-related premiums on such individuals.
Emergency Supplemental Appropriations for FY 1999	Transferred federal share of settlement funds from national tobacco litigation to states.
Breast and Cervical Cancer Treatment and Prevention Act of 2000	Allowed states to cover uninsured women with breast or cervical cancer regardless of their income and resources.
Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 (BIPA)	Increased state-specific ceilings on DSH allotments. Required the Secretary of Health and Human Services to issue a final regulation restricting the amount of Medicaid payments that states may make to facilities that are operated by local governments and thus curtail the use of an accounting practice that allowed states to artificially inflate their reimbursable spending. Postponed the expiration of funds appropriated for SCHIP in 1998 and 1999. Allowed additional entities to determine presumptive eligibility.
The Jobs and Growth Tax Relief Reconciliation Act of 2003	Raised all state Medicaid matching rates by 2.95 percentage points for the period April 2003 through June 2004 as temporary federal fiscal relief for the states due to the downturn in the economy.

Medicare Prescription Drug, Improvement, and Modernization Act of 2003	Transferred drug coverage of individuals dually eligible for Medicare and Medicaid to Medicare starting in 2006. Medicaid still to provide some prescription drug coverage for the dually eligible population for prescription drugs not covered under the newly created Medicare Part D.
Deficit Reduction Act of 2005 (DRA)	Provided states with increased flexibility to make significant reforms to their Medicaid programs. Refined eligibility requirements for Medicaid beneficiaries by tightening standards for citizenship and immigration documentation and by changing the rules concerning long-term care eligibility.
Medicare, Medicaid, and SCHIP Extension Act of 2007	Reauthorized CHIP through April 2009 at then-current funding levels.
Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA)	Reauthorized CHIP through 2013 and expanded federal funding for children's coverage by $33 billion over the next four and half years. Established an upper income limit of 300 percent of the FPL for states to receive the more generous federal CHIP matching rate, with an exception for states that already had permission to cover higher-income children. Allowed states the option to expand coverage to legal immigrant children and pregnant women during their first five years in the country. Required states to cover dental services and required parity of mental health services.
Patient Protection and Affordable Care Act of 2010 (PPACA) and Health Care and Education Reconciliation Act of 2010 (HCERA)—together known as the Affordable Care Act (ACA)	Expanded Medicaid to include all individuals under age sixty-five in families with income below 138 percent of the FPL starting in 2014. (Technically, the income limit is 133 percent of the FPL, but the act also provided for a 5 percent income disregard.) The Supreme Court ruling in 2012 made this coverage expansion optional for states. Broadened availability of long-term care services and supports, starting as early as 2010 in some instances. Extended the authorization of the federal CHIP program for an additional two years, through September 30, 2015. Required states to maintain current income eligibility levels for CHIP through September 30, 2019. States prohibited from implementing eligibility standards, methodologies, or procedures more restrictive than those in place as of March 23, 2010, with the exception of waiting lists for enrolling children in CHIP.

Sources: Congressional Research Service (1993), Gruber (2003), Schneider et al. (2002), Schneider (1997), Congressional Budget Office (2001), Urban Institute (2015), Kaiser Family Foundation (2008), US Social Security Administration (2011), Office of the Legislative Counsel (2010), Kaiser Commission on Medicaid and the Uninsured (2009), and Centers for Medicare & Medicaid Services (2013).

vendor payments for the benefit of cash assistance beneficiaries. Historical accounts of the origin of Medicaid indicate that it passed Congress with very little discussion, being viewed as largely an improvement on the existing Kerr-Mills program (Moore and Smith 2005).

The combination of building on an existing program that was tightly linked to cash assistance receipt and responding to widespread concern about impoverishment through rising health care costs led to the creation of two classes of beneficiaries. The first group was the *categorically needy*: recipients of certain cash assistance programs, including Aid to the Blind, Aid to Families with Dependent Children (AFDC), and Aid to the Permanently and Totally Disabled. These programs were not only strictly means tested, but they also applied only to the blind, the elderly, the disabled, and members of families with a single parent. The second class of beneficiaries was the *medically needy*: individuals who would be categorically eligible except that their income and resources were above the eligibility cutoff, but who had sufficient medical expenses to bring their income after medical expenses below the cutoff (known as "spend down"). The goals of the program at its creation were thus to provide access to medical care to those viewed as the neediest members of society and to prevent medical expense-induced indigence among single-parent families, the disabled, and the elderly (Moore and Smith 2005; Weikel and LeaMond 1976).

As with the Kerr-Mills program that preceded it, participation in Medicaid was made optional for states, although if a state elected to participate it had to include all of the public assistance categories and all recipients within those categories, and if a state chose to have a medically needy program it had to open that program to members of all eligibility categories. Although state participation was optional, Congress included in the legislation incentives for states to participate. Federal funds for earlier medical assistance programs were scheduled to end within five years, funds were offered not only to match state expenditures but also to help pay for the administration of the Medicaid program, and states participating in the Medicaid program could use its more favorable matching rate for their other categorical assistance programs (Moore and Smith 2005). The federal match rate, or federal matching assistance percentage (FMAP), is determined annually for each state s based on a formula that compares a state's average per capita income level (Y_S) with the national average income level (Y_N): $\text{FMAP}_S = 1–0.45(Y_S / Y_N)^2$. According to this formula, a state where per capita income equals the national average pays 45 percent of program expenditures. No state is required to pay more than 50 percent; in most years since the start of the program between ten and fourteen higher-income states have had an FMAP of 50 percent. A state's FMAP is capped by law at 83 percent.[2]

2. Since fiscal year 1998, Washington DC's FMAP has been set permanently at 70 percent. At different times Congress has temporarily increased FMAPs in response to economic crises.

Table 1.2 States' decision on ACA and year of original implementation of Medicaid

	Not implementing ACA Medicaid expansion	Implementing ACA Medicaid expansion	Implementing a modified ACA Medicaid
1966	ID, LA, ME, NE, OK, UT, WI[a]	CA, CT, DE, HI, IL, KY, MD, MA, MN, NH[b], NM, ND, OH, RI, VT, WA, WV	MI[c], PA[d]
1967	GA, KS, MO, SD, TX, WY	NV, NY, OR	IA[e], MT[f]
1968	SC	DC	
1969	TN, VA	CO	
1970	AL, FL, MS, NC	NJ	AR[g], IN[h]
1971			
1972	AK		
1982*		AZ	

Sources: Kaiser Family Foundation State Health Facts (http://kff.org/medicaid/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/), Arizona Health Care Cost Containment System Section 1115 waiver description (http://www.azahcccs.gov/reporting/federal/waiver.aspx), and Gruber (2003); data current as of June 2015.

[a]Wisconsin amended its Medicaid state plan and existing Section 1115 waiver to cover childless adults with incomes up to 100 percent FPL in Medicaid, but did not adopt the ACA Medicaid expansion.

[b]New Hampshire implemented the Medicaid expansion as of July 1, 2014, but the state plans to seek a waiver at a later date to operate a premium assistance model.

[c]Michigan is implementing the Healthy Michigan plan using a Section 1115 waiver, under which monthly premiums and required copayments will be instituted. (See http://kff.org/medicaid/fact-sheet/medicaid-expansion-in-michigan/ for more details.)

[d]Pennsylvania is implementing a Section 1115 waiver to expand Medicaid coverage to adults under 138 percent FPL through privately managed care plans, with premiums for newly eligible adults 100–138 percent FPL. (See http://files.kff.org/attachment/medicaid-expansion-in-pennsylvania-fact-sheet for more details.)

[e]Iowa is using a Section 1115 waiver to charge monthly premiums for people with incomes between 101–38 percent FPL and another Section 1115 waiver to cover newly eligible beneficiaries with incomes at or below 100 percent FPL under Medicaid managed care. (See http://files.kff.org/attachment/medicaid-expansion-in-iowa-fact-sheet for more details.)

[f]Montana has enacted legislation adopting a modified expansion that requires premiums and copayments. The legislation requires federal waiver approval before it can go into effect.

[g]Arkansas is implementing a premium assistance model using a waiver. (See http://files.kff.org/attachment/medicaid-expansion-in-arkansas-fact-sheet for more details.)

[h]Indiana has a pending waiver for an alternative Medicaid expansion plan.

*Indicates a gap between 1982 and the preceding year.

Over half of the states began participating in the first year of the program (see the rows of table 1.2 that show which states began participating in each year), with another eleven states beginning to participate in 1967. By 1970 all but two states (Alaska and Arizona) were participating. Generosity of the FMAP was not the only factor determining when states began partici-

The most recent case was in 2009 as part of the American Recovery and Reinvestment Act. The FMAPs from the beginning of Medicaid through the current year may be found at http://aspe.hhs.gov/health/fmap.cfm.

pating, as some states with high match rates (including Alabama, Arkansas, and Mississippi) began participating much later than other states. For comparison, the table also shows which states have decided (as of spring 2015) to participate in the Medicaid expansion offered by the ACA; there is some correlation between deciding not to participate in the ACA at its inception and late participation in the Medicaid program. The ACA participation decision and what it entails are discussed further in the section on the most recent time period, below.

Eligibility for Families

In the initial period of Medicaid, eligibility for poor children and their families required eligibility for AFDC. To qualify for AFDC a family was required to pass stringent income and resource tests, which were far below the poverty level in most states, and generally the family must have been either headed by a single parent or have an unemployed primary earner (in states with the optional AFDC-Unemployed Parent program). An exception to the family structure requirements was created shortly after the establishment of Medicaid by the Social Security Amendments of 1967, which allowed states to extend Medicaid coverage to "Ribicoff children." Named after the senator who sponsored the legislation, these were children who did not meet the family-structure requirements for AFDC, but who nevertheless met the income and resource requirements. The income tests required that family income less disregards for work expenses and child care be below the state-determined *need standard*, an amount that differed depending on family size. Beginning in the early 1980s, additional income tests were added so that income less disregards less a small amount of earnings needed to be below the state's *payment standard* (also a function of family size) and gross income needed to be below a multiple of the state's need standard. Finally, the resource test required family resources to be below $1,000, not including the value of the home.

For illustration, calculations of the income-eligibility limits as a percentage of the poverty line for a family with three members for 1987 are shown in column (1) of table 1.3. The limits in column (1) illustrate two points: there was considerable variation in eligibility limits across states, and the income limits were well below the poverty line. Even the most generous states required family incomes to be below 85 percent of the poverty line, while the least generous states only covered families with incomes below one-third of the poverty line. (The other columns of table 1.3, which show eligibility limits for children in later years, are discussed below.)

Eligibility for Disabled Individuals

Eligibility limits for the disabled population were also fairly stringent, although somewhat less stringent than for families. From 1966 to 1972, disabled individuals needed to qualify for the Aid to the Permanently and

Table 1.3 **Changes in eligibility limits for children[a]**

State	Prior to expansions (1987)[b] (1)	Prior to CHIP (1997) inf. / <6 / 6–14 / 15–19 (2)	Under CHIP (2001) infants / older children (3)	Prior to ACA (2013) with CHIP (* = Medicaid limits lower) (4)	After ACA (2014)[c] with CHIP (* = Medicaid limits lower) (5)
Alabama	16	133 / 133 / 100 / 15	200 / 200	300*	317*
Alaska	82	133 / 133 / 100 / 76	200 / 200	175	208
Arizona	40	140 / 133 / 100 / 32	200 / 200	200*	205*
Arkansas	26	200 / 200 / 200 / 200	200 / 200	200	216
California	85	200 / 133 / 100 / 82	300 / 200	250*	266
Colorado	48	133 / 133 / 100 / 39	185 / 185	250*	265*
Connecticut	81	185 / 185 / 185 / 185	300 / 300	300*	323*
Delaware	43	185 / 133 / 100 / 100	200 / 200	200*	218*
District of Columbia	50	185 / 133 / 100 / 37	200 / 200	300	324
Florida	36	185 / 133 / 100 / 28	200 / 200	200*	215*
Georgia	35	185 / 133 / 100 / 39	235 / 235	235*	252*
Hawaii	56	185 / 133 / 100 / 100	200 / 200	300	313
Idaho	42	133 / 133 / 100 / 29	150 / 150	185*	190*
Illinois	47	133 / 133 / 100 / 46	200 / 185	300*	318*
Indiana	35	150 / 133 / 100 / 100	200 / 200	250*	255*
Iowa	52	185 / 133 / 100 / 39	200 / 200	300*	317*
Kansas	55	150 / 133 / 100 / 100	200 / 200	232*	250*
Kentucky	27	185 / 133 / 100 / 33	200 / 200	200*	218*
Louisiana	26	133 / 133 / 100 / 100	150 / 150	250*	255*
Maine	56	185 / 133 / 125 / 125	200 / 200	200*	213*
Maryland	47	185 / 185 / 185 / 34	200 / 200[d]	300	322
Massachusetts	67	185 / 133 / 133 / 133	200 / 200	300*	305*
Michigan	65	185 / 150 / 150 / 150	200 / 200	200*	217*
Minnesota	73	275 / 275 / 275 / 275	280 / 275	280 (inf.) / 275	288 (inf.) / 280

(*continued*)

Table 1.3 (continued)

State	Prior to expansions (1987)[b] (1)	Prior to CHIP (1997) inf. / <6 / 6–14 / 15–19 (2)	Under CHIP (2001) infants / older children (3)	Prior to ACA (2013) with CHIP (* = Medicaid limits lower) (4)	After ACA (2014)[c] with CHIP (* = Medicaid limits lower) (5)
Mississippi	16	185 / 133 / 100 / 34	200 / 200	200*	214*
Missouri	38	185 / 133 / 100 / 100	300 / 300	300*	305*
Montana	49	133 / 133 / 100 / 41	150 / 150	250*	266*
Nebraska	48	150 / 133 / 100 / 34	185 / 185	200	218
Nevada	39	133 / 133 / 100 / 45	200 / 200	200*	205*
New Hampshire	55	185 / 185 / 185 / 185	300 / 300	300	323
New Jersey	55	185 / 133 / 100 / 41	350 / 350	350*	355*
New Mexico	35	185 / 185 / 185 / 185	235 / 235	235	305
New York	68	185 / 133 / 100 / 87	185 / 185	400*	405*
North Carolina	36	185 / 133 / 100 / 100	200 / 200	200*	216*
North Dakota	51	133 / 133 / 100 / 100	140 / 140	160*	175*
Ohio	41	133 / 133 / 100 / 32	200 / 200	200	211
Oklahoma	43	150 / 133 / 100 / 48	185 / 185	185	210
Oregon	55	133 / 133 / 100 / 100	170 / 170	300*	305*
Pennsylvania	52	185 / 133 / 100 / 100	235 / 235	300*	319*
Rhode Island	69	250 / 250 / 250 / 250	300 / 300	250	266
South Carolina	27	185 / 133 / 100 / 18	150 / 150	200	213
South Dakota	50	133 / 133 / 100 / 100	200 / 200	200*	209*
Tennessee	21	400 / 400 / 400 / 400	400 / 400 / 100[e]	250*	255*
Texas	25	185 / 133 / 100 / 17	200 / 200	200*	206*
Utah	52	133 / 133 / 100 / 100	200 / 200	200*	205*

Vermont	79	225 / 225 / 225 / 225	300 / 300	300	318
Virginia	49	133 / 133 / 100 / 100	200 / 200	200*	205*
Washington	68	200 / 200 / 200 / 200	250 / 250	300*	305*
West Virginia	34	150 / 133 / 100 / 100	200 / 200	300*	305*
Wisconsin	75	185 / 185 / 100 / 100	185 / 185 (200 after enrlmt.)	300*	306*
Wyoming	49	133 / 133 / 100 / 55	133 / 133	200*	205*

Sources: Shore-Sheppard (2003, table 1); Heberlein et al. (2013); Kaiser Family Foundation "Medicaid and CHIP Income Eligibility Limits for Children at Application, Effective January 1, 2014." Available at http://kff.org/health-reform/state-indicator/medicaid-and-chip-income-eligibility-limits-for-children-at-application-effective-january-1–2014/ (accessed Nov 11, 2013); Kaiser Family Foundation "Medicaid and CHIP Income Eligibility Limits for Pregnant Women at Application, Effective January 1, 2014." Available at http://kff.org/medicaid/state-indicator/medicaid-and-chip-income-eligibility-limits-for-pregnant-women-at-application-effective-january-1–2014/ (accessed Nov 11, 2013).

[a]Eligibility limits are as a percent of the federal poverty threshold for that year. Note that until the ACA, eligibility limits that are apparently equal may actually differ through differences in the two states' choices of what income and resources are counted.

[b]Eligibility is through eligibility for AFDC; limits are for a family of three.

[c]Difference from prior column may solely be a result of different methods of counting income (see text).

[d]Maryland also had premium assistance eligibility to 300 percent of the poverty threshold.

[e]Tennessee had a 1115 waiver to operate TennCare. Its CHIP expansion covered children <19 born before October 1, 1983, who could not have enrolled in Medicaid before.

Totally Disabled or Aid to the Blind programs to receive Medicaid, but in the Social Security Amendments of 1972, Congress replaced the non-AFDC cash assistance programs with Supplemental Security Income for the Aged, Blind, and Disabled (SSI). Under the SSI program, the federal government funds payments and sets eligibility standards. Income eligibility for SSI is determined by comparing an individual's countable income (monthly income less disregards of $20 of any income and $65 plus one-half of the amount over $65 of earned income) to the federal benefit rate (FBR). The FBR, which was set in 1972 and has been increased by the amount of inflation since then, is roughly 74 percent of the federal poverty level (FPL). States have the option of including a state supplement, and a little less than half of the states do, which increases the income-eligibility limits in those states.

Following the introduction of SSI, Medicaid was intended to continue to be automatic for disabled individuals receiving assistance, but since the SSI eligibility standards were more lenient than what many states had in place in 1972, states could choose not to make Medicaid eligibility automatic with SSI eligibility. This option to use a state-specified standard, known as the "209(b)" option after the section of the 1972 Social Security Amendments enacting it, allowed a state to use eligibility criteria for Medicaid under disability no more restrictive than the ones it used in January 1972.[3] States choosing the 209(b) option must allow individuals to "spend down" to eligibility by deducting medical expenses incurred from countable income. States may also choose not to extend Medicaid eligibility to individuals who are eligible only for the state supplement.

In addition to income eligibility, eligibility for Medicaid under SSI or the 209(b) option also requires individuals to meet asset limits and disability standards. A full discussion of asset and disability provisions of SSI is beyond the scope of this chapter (see chapter 1 on SSI in volume 2), but there are a few elements of these provisions that are important to note. First, asset limits, unlike income limits, are not indexed for inflation, so aside from occasional increases passed by Congress they have been declining in real terms. Second, the level of disability required to receive SSI is severe: an adult must have an "inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment(s) which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months," while a child will be considered disabled "if he or she has a medically determinable physical or mental impairment or combination of impairments that causes marked and severe functional limitations, and that can be expected to cause death or that has lasted or can be expected to last for a continuous period of not less than 12 months."[4]

3. There are eleven 209(b) states.

4. Social Security Administration, "Disability Evaluation under Social Security" (http://www.ssa.gov/disability/professionals/bluebook/general-info.htm).

Because medical expenses for the disabled are usually quite high, the medically needy provisions of Medicaid play a more important role for the disabled (and the elderly) than for the low-income families eligibility category. The medically needy are individuals who would be categorically eligible except that their countable incomes are above the relevant cutoff (for SSI or AFDC) and who have incurred sufficient medical expenses to bring their income minus expenses below the medically need income standard. (Their resources must be below the state-set medically needy resource standard; there is no "spend down" applicable to resources.) States electing to cover the medically needy not only specify the income and resource limits that apply, but may also modify their standard benefits package for the medically needy population.[5] Roughly two-thirds of states have a medically needy program.

Eligibility for the Elderly

Eligibility for the elderly population resembles eligibility for the disabled in many ways, with a key exception being the interaction with Medicare for this population. States that participate in Medicaid are required to provide supplemental coverage through Medicaid to low-income Medicare beneficiaries for services not covered by Medicare. Elderly individuals can receive SSI if they are income eligible for it (under the rules discussed above), and the same rules for Medicaid eligibility (including the 209[b] option and the requirement for states to allow spend down to eligibility) apply to elderly SSI recipients as to the nonelderly disabled. Similarly, the elderly may qualify under the medically needy provisions of their state, a common route to eligibility for individuals in nursing facilities. Further expansions of eligibility among the elderly occurred during the period of expansions in the 1980s.

Services and Reimbursement

Within federal guidelines, states choose their own eligibility standards and provider reimbursement rates, resulting in wide variation in such rates across states. The federal government requires certain medical services to be covered, including inpatient and outpatient hospital services, laboratory and X-ray services, physicians' services, and skilled nursing facilities. Beginning with the 1967 Social Security Amendments, states were mandated to cover "early and periodic screening, diagnostic, and treatment" (EPSDT) services for eligible children. States may also choose to cover services such as prescription drugs, eyeglasses, and dental care. Importantly, Medicaid is an entitlement program, so eligible individuals have the right to receive the services that states have chosen to cover, and states have the right to matching payments for the cost of those services.

However, the framers of Medicaid did not realize the significant potential costs of the program (Moore and Smith 2005; Weikel and LeaMond

5. See Schneider et al. (2002) for a detailed discussion of the various pathways onto Medicaid for different categories of disabled individuals.

1976), and already by 1967 there were moves to control expenditures. The 1967 amendments included legislation to cap eligibility among the medically needy to those with incomes at most 133 1/3 percent of the AFDC income eligibility level in a state. In addition, the 1972 amendments repealed the "maintenance of effort" requirement that had previously prevented states from reducing expenditures on Medicaid from one year to the next.

Passage of cost-control measures continued in the early 1980s. The Omnibus Budget Reconciliation Act of 1981 (OBRA 1981) implemented several changes with major long-term implications for health care providers. First, OBRA 1981 repealed the requirement that states pay Medicare hospital payment rates. Instead, states were permitted to reimburse hospitals at lower rates and to make additional payments to hospitals serving a disproportionate share of Medicaid and other poor patients. These hospitals became known as disproportionate share hospitals (DSH) and payments to them were known as "DSH payments." Second, OBRA 1981 also established new types of "Medicaid waivers" as additional potential cost-control mechanisms. A waiver is a statutorily established permission for the federal agency charged with Medicaid implementation and regulation to grant certain exceptions to the federal rules for states that apply for those exceptions. Some waiver authority had already existed, notably that granted by Section 1115 of the Social Security Act, which allows the Secretary of Health and Human Services to permit a state to use federal Medicaid matching funds to pay for a statewide demonstration covering expenditures that would otherwise not be allowable. A state seeking a Section 1115 waiver must show that its demonstration will be "budget neutral" to the federal government over the five-year period of the waiver.[6] The new waivers included section 1915(b) freedom-of-choice waivers, which allowed states to pursue mandatory managed-care enrollment of certain Medicaid populations, and section 1915(c) home- and community-based long-term care services waivers, which allowed states to cover such services for the elderly and individuals with disabilities at risk of institutional care. In addition, the Tax Equity and Fiscal Responsibility Act of 1982 expanded state options for imposing cost-sharing requirements on beneficiaries.

1.2.2 Period of Incremental Expansions: 1984–1995

Following a period of legislative focus on cost containment, beginning in the mid-1980s there was a period of legislative focus on eligibility expansion. These expansions began by relaxing some of the family structure, but not income, requirements for members of low-income families. The Deficit Reduction Act of 1984 mandated coverage of three groups—children born after September 30, 1983, first-time pregnant women, and pregnant women

6. Arizona's Medicaid program has operated under a Section 1115 waiver since its inception in 1982.

in two-parent families with an unemployed primary earner—as long as the families were income eligible for AFDC. Then beginning in 1986, a series of federal laws began to diminish the link between Medicaid eligibility and AFDC eligibility by extending Medicaid coverage to members of families with incomes above the AFDC limits. Under these expansions, Medicaid eligibility determination was different from AFDC eligibility determination in two fundamental ways: the eligibility limits were linked to the federal poverty line rather than to the AFDC limits, and there were no family structure requirements. In the Omnibus Budget Reconciliation Acts (OBRAs) of 1986 and 1987, Congress gave states the authority to raise the income thresholds for Medicaid coverage of pregnant women, infants, and very young children above the AFDC level. In addition, OBRA 1987 required states to cover all children born after September 30, 1983, who met AFDC income standards, regardless of their family composition. The Medicare Catastrophic Coverage Act (MCCA) and Family Support Act (FSA), both of 1988, required states to extend Medicaid eligibility even further. The MCCA required coverage of pregnant women and infants and permitted coverage of children up to eight years of age with family incomes below 75 percent of the poverty level. Coverage of eligible two-parent families where the principal earner was unemployed was mandated by the FSA, and the FSA also required states to extend transitional Medicaid benefits for twelve months to members of families losing cash assistance due to earnings from work. Even broader expansions took place as a result of OBRA 1989 and OBRA 1990. The OBRA of 1989 required coverage of pregnant women and children up to age six with family incomes up to 133 percent of the federal poverty level, and OBRA 1990 required states to cover children born after September 30, 1983 and under the age of eighteen with family incomes below 100 percent of the federal poverty level.

The resulting eligibility limits that states established under these mandatory and optional expansions (and in some cases with the addition of state funds) as of the beginning of 1997 are shown in column (2) of table 1.3. The increase in eligibility limits was strikingly large, with eligibility limits doubling, tripling, or increasing even more substantially over the AFDC income limits. Notably, there was substantial variation in eligibility limits by age within states, with limits being more generous for infants and least generous for older teens. The extent of within-state variation also varied, with some states having fairly similar eligibility limits across the board and others having larger differences. These differences in eligibility within and across states and over time have proven useful in examining the impacts of Medicaid on various outcomes, as discussed in section 1.3.

This period was also a time of considerable expansion in eligibility for the elderly. Recognizing that there were substantial numbers of elderly Medicare beneficiaries with incomes above the SSI cutoff level but who needed assistance with Medicare premiums and cost-sharing requirements,

OBRA 1986 permitted and the MCCA required states to phase in coverage of Medicare premiums and cost sharing for Medicare beneficiaries with incomes below 100 percent of the federal poverty level and resources at or below twice the SSI resource cutoff. States must use income- and resource-counting methodologies that are not more restrictive than those used for SSI, and may be less restrictive. These beneficiaries are known as Qualified Medicare Beneficiaries, or QMBs. The OBRA of 1990 established an additional category of Medicare-Medicaid dual eligibles, Specified Low-Income Medicare Beneficiaries, or SLMBs. States were required to provide Medicare premium assistance through Medicaid to Medicare beneficiaries with incomes between 100 and 120 percent of the FPL and with resources not exceeding twice the SSI resource level. Together, assistance to these two groups is known as the Medicare Savings Programs.

In addition to expansions in eligibility for the elderly, the MCCA included provisions to prevent "spousal impoverishment" among spouses of individuals receiving long-term care through Medicaid. These provisions have as their goal permitting the spouse still living in the community to have sufficient resources and monthly income to avoid hardship. They are triggered when one spouse enters a long-term care facility (and is likely to remain at least thirty days). The spouse remaining in the community is allowed to keep a fraction of the couple's resources and a fraction of the income received on a monthly basis. The rest is contributed to the cost of care for the institutionalized spouse. In general, due to the high cost of institutional care and the low level of income and resources required to qualify for Medicaid to pay for such care, complex rules governing transfers of assets and income were developed over this period. These rules included those attempting to discourage individuals from giving away resources to qualify for Medicaid and those intended to provide individuals in states without medically needy programs whose incomes or resources are too high to qualify for Medicaid but too low to pay for needed institutional care with ways to qualify for Medicaid. For example, such individuals may establish a Qualified Income, or Miller, trust by depositing enough income in the trust to fall below an income limit equal to 300 percent of the SSI income limit; once the individual passes away, the state receives any money remaining in the trust up to the amount Medicaid has paid on behalf of the individual (see Schneider et al. [2002] for a detailed discussion of such rules).

The period of incremental expansions was also one of substantial growth in Medicaid expenditures, as can be seen in the discussion of program statistics later in the chapter. While the increasing number of eligible individuals is one obvious source of an increase in expenditures, a key element in the increase over this time period was the increasing state use of DSH payments and related financing programs, including provider-specific taxes and intergovernmental transfers (Ku and Coughlin 1995). States developed creative financing strategies in an effort to maximize federal transfers, requiring

hospitals to pay provider taxes or to make donations or intergovernmental transfers, using the revenue from these sources to make DSH payments (usually back to the providers of the taxes or transfers), and then receiving the federal match on these expenditures. Concern over rapidly rising federal expenditures on Medicaid as a result of these strategies led to the Medicaid Voluntary Contribution and Provider-Specific Tax Amendments of 1991, which essentially banned provider donations, capped provider taxes, and required such taxes to be broad based and not targeted on a quid pro quo basis, and capped DSH payments (Ku and Coughlin 1995).

Another important change that occurred during this period was a move toward the use of managed-care contracts for Medicaid enrollees, including both capitated plans such as Health Maintenance Organizations (HMOs) and noncapitated primary care case-management plans. The potential benefits for states in using Medicaid managed care include a reduction in program expenditures (through the incentive inherent in capitated plans to reduce the use of unnecessary treatments), an improvement in quality through care coordination efforts, and a reduction in the level of financial risk faced by the state (Duggan and Hayford 2013). While managed-care plans in the commercial market often reduce expenditures via contracting with providers for lower reimbursement rates, the already low reimbursement rates in fee-for-service Medicaid leave little room for savings along that dimension.

1.2.3 Major Changes: Welfare Reform to the Affordable Care Act[7]

While the mid-1980s to mid-1990s were a period of incremental changes, the changes in Medicaid since the mid-1990s have been some of the most far reaching in Medicaid's history, with three major pieces of legislation fundamentally changing the program. The first was the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), which eliminated the AFDC program and replaced it with the Temporary Assistance for Needy Families (TANF) program, completing the process of decoupling Medicaid for low-income families from cash assistance eligibility. Unlike AFDC, TANF eligibility does not confer automatic Medicaid eligibility. Instead, Medicaid eligibility began to be determined separately, although individuals who met the requirements for the former AFDC program were intended to continue to be entitled to Medicaid. States were required to continue using the AFDC eligibility determination processes they had in place as of July 16, 1996. Thus an individual could be eligible for Medicaid but not TANF, or vice versa.

The most important impact of the decoupling of Medicaid from TANF eligibility was the impact on coverage for low-income parents. The requirement that states continue to cover parents who would have been eligible

7. Additional sources for this section: Kaiser Commission on Medicaid and the Uninsured (2012, 2014a, 2014b) and Rudowitz, Artiga, and Musumeci (2014).

under the former AFDC standards (known as Section 1931 eligibility) provided a basis for further expansions to parents. For the most part, the changes due to PRWORA did not affect eligibility for children since the expansion standards for children, which were more generous than AFDC eligibility standards, remained in place. However, Medicaid enrollment among children did fall immediately following the passage of PRWORA before rising again a few years later (see section 1.3 of this chapter). Also as part of PRWORA, legal immigrants were required to wait five years before they could be eligible for federally funded Medicaid, and illegal immigrants are ineligible for Medicaid. Both groups of immigrants are eligible for emergency Medicaid, however, which covers services necessary to treat an emergency medical condition for such individuals as long as they meet all other Medicaid requirements except for their immigration status. Some states did continue to provide Medicaid coverage with state funds to legal immigrants.

Another key piece of legislation was the Balanced Budget Act (BBA) of 1997. The BBA included many smaller changes to Medicaid and introduced a new public health insurance program for low-income children. Among the smaller changes enacted in the BBA, states were allowed to provide up to twelve months of continuous eligibility for children and to cover children presumptively until a formal determination of eligibility is made. The BBA also established a new level of support for Medicare beneficiaries with higher incomes, allowing partial coverage of Medicare premiums for beneficiaries with incomes between 120 and 135 percent of FPL (known as Qualified Individuals, or QIs), funded via a federal block grant. On the expenditure and reimbursement side, the BBA eliminated minimum payment standards for state-set reimbursement rates for hospitals, nursing homes, and community health centers, placed ceilings on DSH payment adjustments, and allowed states to avoid paying Medicare deductibles and coinsurance if their Medicaid payment rates for that service are lower than Medicare's. Instead, the state pays only the Medicaid reimbursement rate, and the providers are not permitted to bill the beneficiary for the balance. This practice effectively reduces the incentive for providers to treat low-income beneficiaries (Schneider et al. 2002). The BBA also allowed states to implement mandatory managed-care enrollment for most Medicaid beneficiaries without obtaining section 1915(b) waivers.

In addition, the BBA created the State Children's Health Insurance Program (called SCHIP at the time, but since changed to CHIP; we use the later acronym throughout this chapter), which provided states with $40 billion over ten years in block-grant funding to expand publicly provided health insurance for children. The basic structure of CHIP differs from Medicaid in several ways. First, each state is given a fixed allotment (rather than an entitlement to an unlimited federal match of spending) based on the number of uninsured children in the state and the state's relative health care costs. Second, the match rate is higher than under Medicaid, ranging from 65 to

85 percent. Third, states are given more flexibility by the federal government in structuring CHIP coverage.

States had three options for their CHIP funds: they could expand their Medicaid programs to cover additional ages and income categories, design a new program, or do a combination of the two, enacting an initial Medicaid expansion (for example, to fill in gaps in coverage across the age distribution) while designing further coverage under a state program. However states could not tighten their Medicaid rules, and applicants who qualified for Medicaid under the Medicaid eligibility standards in place prior to the introduction of CHIP had to be enrolled in Medicaid. If a state expanded its Medicaid program, children eligible under the CHIP expansion became entitled to all Medicaid benefits, and the state was required to conform to all Medicaid rules. If a state created a new program (or expanded an existing state program), then the state could design new benefits packages or arrangements for services, impose limited cost sharing, and design its own eligibility rules. The state-designed programs sometimes included some cost sharing (such as small premiums or copayments), were usually (though not exclusively) operated separately from Medicaid, and often incorporated a managed-care component. In a few cases, the state plans included completely new features, such as premium assistance for employer-sponsored insurance or coverage for parents of eligible children. State CHIP plans of all types involved new outreach efforts and were required to include efforts to minimize substitution of public insurance for private insurance (known as "crowding out"). In states with non-Medicaid-expansion CHIP plans, children who had other coverage were not eligible for the CHIP expansion (such children would be eligible for Medicaid, if their family incomes were low enough). In addition, many states incorporated a waiting period of between a month and a year, depending on the state, before a child could be enrolled in the state program after having private coverage. Other anti-crowd-out measures included premiums for higher-income families and state assistance with employer-sponsored insurance premiums.

The resulting eligibility limits under CHIP as of 2001 are shown in column (3) of table 1.3. Notably, CHIP permitted states to equalize eligibility across ages within a state, and while some states continued to have higher levels of eligibility for younger children, the extent of the disparity was considerably smaller. It is also clear that states were able to increase their eligibility limits overall, in most cases to two to three times the FPL.

States were permitted to spend up to 10 percent of their block grants for items other than providing insurance, and most states used some of these funds to improve participation in public health insurance. One important change in many states was the implementation of a period of continuous coverage (usually six months or a year). This means that once children qualify for coverage, coverage continues without interruption for the entire period, even if the child's family income increases. Other important changes

that many states adopted include: elimination of a requirement that family assets be below a given level, elimination of the requirement that families come to the welfare office for a face-to-face interview (allowing applications to be mailed in), making the application simpler and/or instituting a single application for both Medicaid and CHIP programs, and outreach and publicity efforts. Outreach efforts that states report implementing took many forms, including partnerships with community organizations such as schools, health clinics, and community groups to promote enrollment, placing eligibility workers who can help fill out the forms in locations other than welfare offices, instituting a toll-free hotline to help with enrollment questions, and bilingual or multilingual applications and eligibility workers.

After its first ten years, CHIP came up for renewal in 2007. Twice Congress passed bills reauthorizing CHIP, but both bills were vetoed by President Bush. One of the main areas of disagreement was over offering coverage to higher-income children, with Congress voting to offer coverage to higher-income children and the administration expressing concern about negative effects of crowd-out. In late 2007 the Medicare, Medicaid, and SCHIP Extension Act of 2007 was passed and signed, largely maintaining existing funding levels for the program on a short-term basis. Then in 2009 the Children's Health Insurance Program Reauthorization Act (CHIPRA) reauthorized the program, provided additional funding and made other significant changes. An important change related to eligibility is the removal of the five-year waiting period requirement for immigrant children and pregnant women in Medicaid and CHIP, giving states the option of receiving federal funding to provide coverage to these populations without a waiting period. The CHIPRA also changed the financing formula. Instead of being based on estimates of per capita health costs and the number of uninsured children, state allotments are now based on historical CHIP spending, with rebasing every two years and annual updates for cost inflation and population growth.

The results of the coverage expansions to children beginning in the late 1980s and continuing through CHIPRA can easily be seen in figure 1.1, an updated version of a figure from Card and Shore-Sheppard (2004). Health insurance coverage rates by family income as a percent of the poverty line among children exhibited a distinct U-shape prior to the expansions, as Medicaid was available only to the poorest children and private coverage rates did not equal or exceed Medicaid coverage rates except for children in families with incomes around 1.5 times the poverty line. Over the next twenty-five years, as the expansions took effect, insurance coverage rates smoothed out across the income distribution so that even at the lowest point coverage rates were around 85 percent, climbing above 90 percent for children with incomes above three times the poverty line.

In addition to the optional expansions in the laws discussed previously, over this period the federal government used its regulatory authority to add

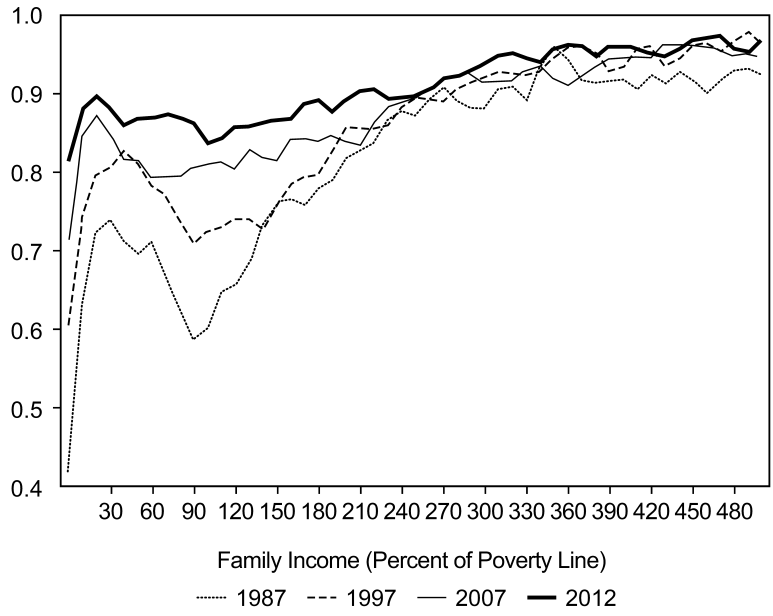

Fig. 1.1 Children's health insurance coverage rates by family income, 1987–2012
Source: Updated version of figure 1 from Card and Shore-Sheppard (2004). Data from Current Population Survey Annual Demographic File.

several provisions to the Medicaid rules or to encourage their use, permitting states to expand eligibility further.[8] The first policy shift, known as the 1902(r)(2) option after the section that was added to the Social Security Act by the MCCA, allowed states to use more liberal methods for calculating income and resources for some categories of Medicaid eligible individuals. For example, states could choose to disregard some family income or resources when determining eligibility. This raises the effective income eligibility level above the official maximum level by reducing the amount of income actually counted. Importantly, states were permitted to increase eligibility in this way for Section 1931 eligibles (low-income parents) as well as for children and pregnant women (Davidoff et al. 2004). As a result, many states' eligibility limits became considerably more generous to parents (Aizer and Grogger 2003). The second change was to encourage the use of Section 1115 waivers. In 2001 the executive branch used its regulatory authority to implement the Health Insurance Flexibility and Accountability (HIFA) waiver initiative, which encouraged states to apply for waivers that expanded

8. The federal regulatory agency with primary authority in interpreting and implementing Medicaid legislation was known as the Health Care Financing Administration (HCFA) until June 2001, when its name was changed to the Centers for Medicare and Medicaid Services (CMS).

coverage without expanding funding by using changes in benefits packages and cost-sharing provisions to help finance the expansions. In particular, some states obtained Section 1115 waivers in order to provide some coverage to childless, nondisabled adults, the only way in which such individuals could be covered under Medicaid. Because these waivers were required to be budget neutral for the federal government, they often entailed limits on benefits, higher cost sharing, or enrollment caps (Rudowitz, Artiga, and Musumeci 2014).

A somewhat less well-known change that occurred to Medicaid during this period came about because of the master settlement agreement between forty-six states and the District of Columbia and tobacco manufacturers. In the settlement, manufacturers agreed to make annual payments to the states intended to recompense them for the cost to state Medicaid programs of treating tobacco-induced illnesses (Schneider et al. 2002). In addition, the federal government allowed states to keep the federal share as well, and moreover states were permitted to use the tobacco payments to fund the state portion of Medicaid, effectively raising the federal match rate above the nominal matching rate.

The Affordable Care Act

Arguably the most far-reaching change to Medicaid is the one that was implemented most recently: the Patient Protection and Affordable Care Act of 2010 and the Health Care and Education Reconciliation Act of 2010—together known as the Affordable Care Act, or ACA. By the time of the passage of the ACA, Medicaid eligibility had expanded substantially, but was still largely limited to individuals in the original mandated groups (families, the disabled, and the elderly). As discussed above, a few states had extended eligibility under waivers to able-bodied, low-income adults who are not parents. Under the ACA, Medicaid eligibility levels for children younger than six were intended to remain largely unchanged, as were eligibility levels for pregnant women. For older children, if the state covered children with family incomes between 100 and 133 percent of the FPL under a separate CHIP plan, sometimes referred to as "stair-step" eligibility, the state was required to transition those children from separate CHIP to Medicaid. The most significant change in the ACA, however, was the potential expansion of Medicaid eligibility to adults. According to the original legislation, Medicaid was to be expanded to all adults with family incomes below 138 percent of the FPL: 133 percent of the FPL plus a 5 percent income disregard. The legislation included a higher federal match for newly eligible adults—100 percent through 2016, then phasing down to 90 percent in 2020 and following. However, the Supreme Court decision of June 2012 ruled that states would not lose existing Medicaid funds if they did not expand Medicaid for all individuals under 138 percent of the FPL, essentially making the expansion a state option. The decisions of the states

about whether to participate in the Medicaid expansion are shown in the columns of table 1.2.

In addition to changes in eligibility for Medicaid, the ACA called for the creation of marketplaces ("exchanges") for the purchase of nongroup coverage, which would be federally subsidized on a sliding scale for individuals with family incomes below 400 percent of the FPL. The ACA also mandated that individuals obtain insurance coverage or pay a penalty through the tax system. Individuals who cannot obtain affordable coverage (including individuals with incomes below the FPL in states not expanding Medicaid) are exempt from the penalty.[9]

Because eligibility for premium credits through the exchanges is based on income tax rules for counting income and family size, states are required to base eligibility for Medicaid and CHIP for families and able-bodied adults on these same rules to ensure that eligibility is comparable across the different potential sources of coverage. Specifically, the tax-filing unit becomes the basis for family structure calculations, and the ACA establishes a new definition of income known as modified adjusted gross income (MAGI). The MAGI is adjusted gross income (AGI) as determined under the federal income tax, plus any foreign income or tax-exempt interest that a taxpayer receives, and untaxed Social Security benefits (see UC Berkeley Labor Center [2013] for a brief summary of the components of MAGI). Assets are not considered when determining income eligibility. Any previously existing disregards (differing by state and eligibility category) that were applied to income before it was compared to the limits were eliminated and replaced with a single disregard equal to 5 percent of the FPL. Importantly, these changes apply whether or not the state chooses to expand its Medicaid program. However, the blind, elderly, and disabled populations will continue to have financial eligibility determined using existing Medicaid rules (including both income and assets).

The use of MAGI and a fixed 5 percent disregard represents a major change in the way states calculate income eligibility for Medicaid. Prior to the ACA, under the freedom offered by the 1902(r)(2) option, states had some discretion about which types of income to count and how much income to disregard before comparing this net income level to the statutory net income eligibility standard. Thus not only does the ACA standardize the way income is counted across states, but it also changes how much of income is actually counted toward eligibility and which family members are included in the family unit whose income is being combined. Under the ACA, states were required to convert their net income standards to equivalent adjusted gross income standards using one of three possible strategies to determine

9. The affordability standard for individuals is that the plan should cost less than 8 percent of their household income. For other exemptions, see https://www.healthcare.gov/fees-exemptions/exemptions-from-the-fee/.

equivalence and accounting for disregards that were used previously, with the goal being to keep the number of eligible individuals approximately the same (Centers for Medicare and Medicaid Services 2012a). Because of these changes in how income and family groups are defined, however, some individuals in eligibility groups not intended to be affected by the ACA—that is, groups that were already eligible for Medicaid and were intended to remain so—may be affected.

The effects of this change to income-counting methodologies are reflected in the income-eligibility limits made public for states. In column (4) of table 1.3 we show the 2013 income eligibility limits for children, which were applied to income after state-specified disregards (that were not well publicized) were subtracted. (We show the higher of the CHIP and Medicaid eligibility limits, indicating with an asterisk states where Medicaid limits were lower than CHIP limits.) Column (5) shows the income limits in 2014 incorporating the 5 percent disregard; these income limits are applied to the family's MAGI. In most cases the apparent increase between 2013 and 2014 reflects only the change in income-counting methodology and not a true increase in eligibility.

In addition to the eligibility changes discussed above, there are some provisions of the ACA that specifically affect immigrants (Kenney and Huntress 2012). Undocumented immigrants are not eligible for Medicaid and are not eligible to purchase marketplace coverage. Such immigrants will still be eligible for emergency Medicaid and optionally for prenatal care under an option established for CHIP in 2002 allowing states to cover the unborn child (Heberlein et al. 2013). Legal immigrants in states that did not relax the five-year residency rule after being given the option in CHIPRA are still ineligible for Medicaid until they have been in the country for five years, but they may purchase coverage through the exchanges and they are eligible for the tax credit subsidies. Individuals with incomes below 100 percent of the FPL but who are ineligible for Medicaid due to the five-year rule are eligible to receive tax credits for coverage purchased through the exchanges (Stephens and Artiga 2013). They are subject to the mandate, unless they are otherwise exempt for income reasons.

Overall, Medicaid today resembles in many ways the program that was established fifty years ago, although with some key differences. It remains a state-federal partnership, with the partnership being more or less contentious in different states and for different reasons, including federal restrictions on state-desired program flexibility, federal requirements for coverage and service provisions that states may find difficult to meet in difficult economic times, and state attempts to maximize the funding obtained from the federal government. The services provided to beneficiaries have become broader and have included some important additions, although key elements remain the same. Eligibility continues to involve a categorical eligibility determination, although the eligibility pathways have become broader and more numerous.

According to the CMS there are forty-eight mandatory eligibility groups, thirty-two optional eligibility groups (including the ACA category of adults with incomes at or below 133 percent of FPL that would subsume many of the other categories), and nine medically needy categories.[10] The individual's eligibility pathway determines what income limit applies as well as which income-counting methodology will be used. The eligibility pathway also determines whether "spending down" is permitted to qualify for coverage and whether a resource test applies, and if so, which one. Immigration status and date of entry to the United States also affect eligibility. Overall, however, it is clear that the Medicaid program has moved from being a small program that covered only some of the very poorest members of society to a central part of the health care system in the United States.

1.3 Program Statistics

1.3.1 Enrollment and Expenditures

The growth of the Medicaid program is illustrated in figure 1.2, which plots Medicaid enrollment by eligibility category from 1975 to 2010. By 1975, all states but Arizona had implemented the program and total enrollment stood at 22 million people. As has been the case throughout the history of the program, children represented the largest eligibility category, accounting for 43.6 percent of total enrollment. The second-largest eligibility category consisted of nonelderly, nondisabled adults (20.6 percent of total enrollment), followed by aged beneficiaries (16.4 percent), and the disabled (11.2 percent). Enrollment remained essentially constant over the next ten years and then began to increase in the late 1980s and early 1990s as a result of eligibility expansions for pregnant women and children. In the mid-1990s the combined effect of a strong national economy and welfare-reform legislation led to declines in enrollment. Steady growth resumed early in the twenty-first century, and by 2010 more than 65 million people were enrolled in Medicaid.[11]

Over the period shown in the figure, the eligibility category with the greatest total enrollment growth was children; in 2010, children represented 48.4 percent of total Medicaid enrollment. Enrollment among nonelderly adults grew at a slightly higher rate over this period: by an average annual rate of 6.8 percent for nondisabled adults and 7.7 percent for the disabled. In 2010, these two eligibility groups represented 23.8 and 14.3 percent of total Medicaid enrollment, respectively. Enrollment grew much more slowly

10. http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-topics/Waivers/1115/Downloads/List-of-Eligibility-Groups.pdf.

11. Enrollment figures based on administrative data may differ across sources and by the type of count—for example, the number of people enrolled at a point in time or the number enrolled at any point during a given year.

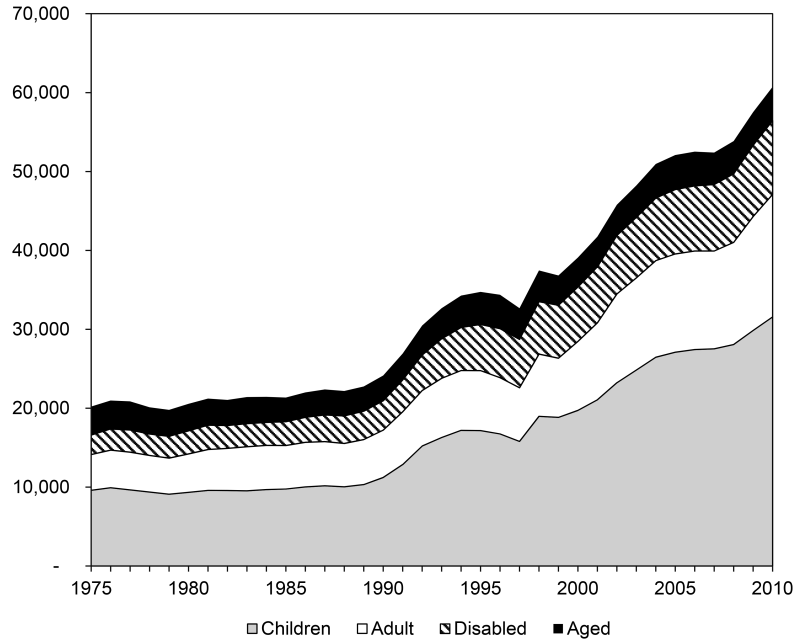

Fig. 1.2 Medicaid enrollment by eligibility category, fiscal years 1975 to 2010

Source: CMS (2012b, table 13.4).

Notes: Data for other/unknown eligibility category not shown. This category represents 6.8 percent of total enrollment in 2010. Child category includes nondisabled children and foster care children and excludes CHIP enrollment. Adult category includes nonelderly, nondisabled adults. Medicaid-eligible persons who during the year received only coverage for managed-care benefits are included, starting in fiscal year 1998.

among the aged. As a result, by 2010 this was the smallest eligibility group, accounting for 6.6 percent of total enrollment.

Open enrollment for the Affordable Care Act's new insurance options began in October 2013 for coverage that became effective in January 2014.[12] For private coverage purchased through the federal or state exchanges, the enrollment period closed at the end of March 2014 (though consumers meeting a variety of criteria could enroll after this date). Enrollment in Medicaid can take place any time during the year. By early 2015, CMS was reporting that Medicaid/CHIP enrollment had increased by between 10 and 11 million people between July–September 2013 and November 2014 (CMS 2015). As of December 2014, total Medicaid/CHIP enrollment was 69.7 million. Among the states that had implemented the ACA eligibility expansion,

12. Several states took advantage of a provision in the law allowing states to expand before 2014. These states transferred beneficiaries in existing state or local programs into Medicaid in addition to expanding coverage to previously uninsured adults (Sommers, Kenney, and Epstein 2014). According to CMS, nearly 950,000 individuals gained coverage as a result of these early expansions (CMS 2014).

enrollment had increased by nearly 9 million, an increase of roughly 27 percent. Fifteen of the expansion states experienced increases of 30 percent or more. In states that chose not to expand Medicaid eligibility, Medicaid/CHIP enrollment grew by 1.5 million or roughly 7 percent. This enrollment growth in nonexpansion states can be interpreted as a "woodwork" or "welcome mat" effect. For example, media attention to the ACA may have raised awareness of the program among people who were previously eligible, but not enrolled. In addition, enrollment may have increased among previously eligible individuals who were afraid they would be subject to a tax penalty if they did not obtain insurance.

Table 1.4 compares 2011 enrollment figures from administrative data to total population counts to calculate coverage rates for the different age groups. One important difference between table 1.4 and figure 1.2 is that the data in the table include CHIP enrollment, whereas the data in the figure do not. Out of 75.8 million people who were enrolled in Medicaid or CHIP at some point in 2011, 40.2 million were children. This figure represents just over half of all children in the United States. Measuring enrollment at a point in time yields a coverage rate of 41.3 percent for children. In 2011, the percentage of nonelderly and elderly adults with Medicaid coverage was substantially lower. The point-in-time Medicaid coverage rates calculated

Table 1.4 **Medicaid and CHIP enrollment by age, data source, and enrollment period (2011), in millions**

	Ever enrolled	Point in time	NHIS	CPS
All ages				
Total Medicaid/CHIP enrollment	75.8	60.4	50.5	50.8
Population	312.3	311	305.9	308.8
Enrollment as a percentage of population	24.3	19.3	16.5	16.5
Children under age 19[a]				
Total Medicaid/CHIP enrollment	40.3	32.4	29.5	26.3[2]
Population	78.5	78.4	78.7	74.1
Enrollment as a percentage of population	51.3	41.3	37.5	35.6
Adults 19–64				
Total Medicaid/CHIP enrollment	29.0	22.4	17.8	20.6
Population	192.1	191.4	187.4	193.2
Enrollment as a percentage of population	15.1	11.7	9.5	10.7
Adults 65 and older				
Total Medicaid/CHIP enrollment	6.5	5.6	3.1	3.9
Population	41.7	41.1	39.7	41.5
Enrollment as a percentage of population	15.5	13.7	7.9	9.4

Sources: Columns (1)–(3) are drawn from tables 16–19 from MACPAC (2014). The MACPAC report data is drawn from Medicaid Statistical Information System (MSIS) as of February 2014; CHIP Statistical Enrollment Data System data as of May 2014; the National Health Interview survey (NHIS); and US Census Bureau vintage 2012 data on the monthly postcensal resident population by single year of age, sex, race, and Hispanic origin. Column (4) is based on DeNavas-Walt, Proctor, and Smith (2012, table C-3).

[a]The CPS data are for children under eighteen years of age.

based on administrative data were 11.7 percent for nineteen- to sixty-four-year-olds and 13.7 percent for adults over age sixty-five. The last two columns report coverage estimates based on the two federal surveys that are most often used in research on health insurance: the National Health Interview Survey (NHIS) and the Current Population Survey (CPS). Although the two surveys ask about insurance coverage in different ways, they produce fairly similar estimates of coverage. Medicaid enrollment tends to be underestimated in survey data (Davern et al. 2009), as can be observed in this table. For all ages, the coverage rate in the two surveys is 16.5 percent, nearly 3 percentage points lower than the point-in-time measure based on administrative data.

Figures 1.3 and 1.4 plot expenditure data by eligibility category for the period 1975 to 2010. Figure 1.3 presents total expenditures expressed in nominal dollars, while figure 1.4 presents payments per beneficiary expressed

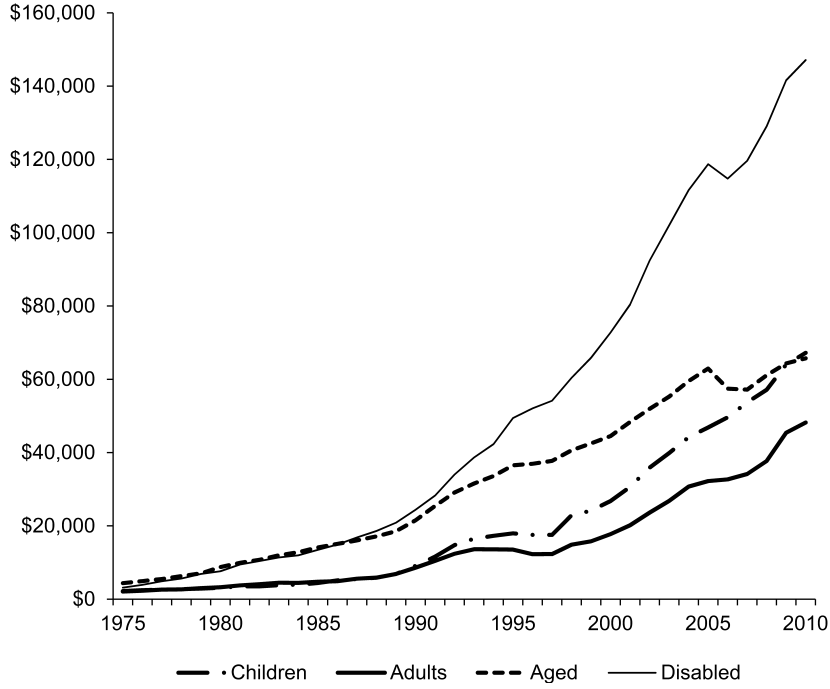

Fig. 1.3 Nominal dollar Medicaid payments by eligibility group, fiscal years 1975 to 2010

Source: CMS (2012b, table 13.10).

Notes: Beginning fiscal year 1998, expenditures capitated premiums for individuals enrolled in managed-care plans were included in this series. The SCHIP payments are excluded. As part of a 2009 revision of the national accounts classification system, components of medical care were changed, and the base year was updated to the year 2005. All personal consumption series were restated for the entire historical period to reflect the new classification structure.

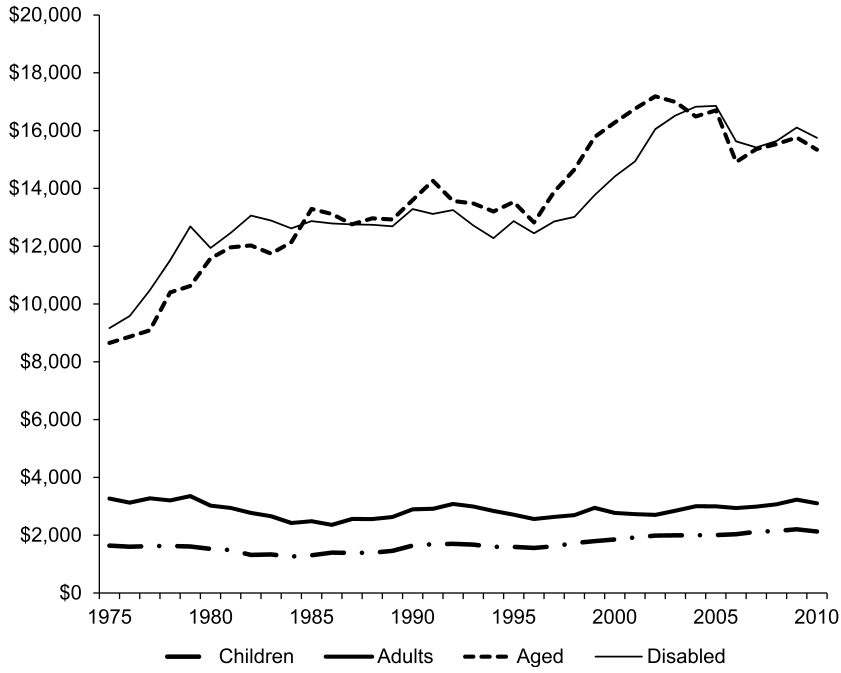

Fig. 1.4 Real spending per beneficiary by eligibility group, fiscal years 1975 to 2010

Source: CMS (2012b, table 13.11).

Notes: Beginning fiscal year 1998, expenditures capitated premiums for individuals enrolled in managed-care plans were included in this series. Beneficiaries covered under SCHIP and their payments are excluded. Dollar amounts are adjusted using a personal consumption expenditure index for health care services (US Department of Commerce, Bureau of Economic Analysis) expressed in fiscal year 2010 dollars. As part of a 2009 revision of the national accounts classification system, components of medical care were changed, and the base year was updated to the year 2005. All personal consumption series were restated for the entire historical period to reflect the new classification structure.

in 2010 dollars. In 1975, real ($2010) per capita spending was $9,165 for the disabled, $8,655 for the aged, $3,268 for other adults, and $1,638 for children. Because in 1975 there were more aged than disabled beneficiaries, total spending was higher for the aged. Per capita expenditures trended similarly for the two groups, but by the late 1980s total spending was greater for the disabled because of higher enrollment growth. Together the aged and disabled account for roughly 20 percent of Medicaid enrollment, but over 60 percent of program expenditures. As would be expected, per capita spending is considerably lower for nondisabled, nonelderly adults and is lowest for children. For both of these groups, the growth in total expenditures from 1975 to 2010 is driven mainly by increased enrollment. Real per capita spending for adults was actually lower in 2010 than in 1975 ($3,102 vs. $3,268). In

2010, the adult eligibility category accounted for 24 percent of enrollment and 14 percent of expenditures. Children, who represent just under half of all Medicaid beneficiaries, account for roughly 20 percent of spending.

Figure 1.5 breaks down Medicaid benefit spending by service category for the entire program and for each of the main eligibility groups. A large share of spending for disabled and aged enrollees is for long-term services and supports: 36 percent for the disabled and 66 percent for the elderly. Across all eligibility categories, Medicaid enrollees who use long-term services and supports represent 6 percent of enrollment and almost half of total spending (MACPAC 2014).

Figure 1.6 plots Medicaid and CHIP spending by the federal government and the states. As noted in section 1.2.1, the FMAP formula that determines how the financing of Medicaid is divided between the federal government and states has not changed since the start of the program. However, twice in

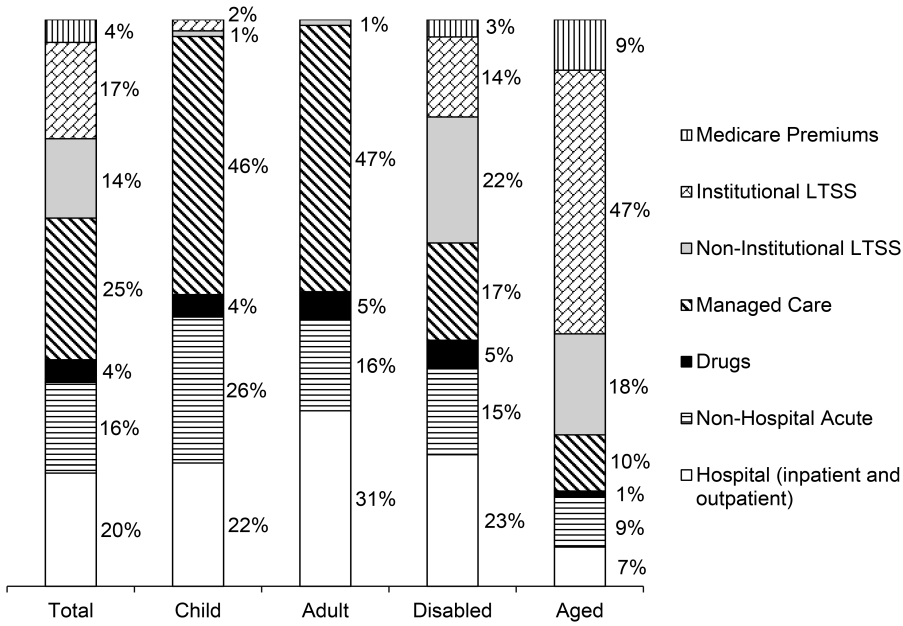

Fig. 1.5 Distribution of Medicaid benefit spending by eligibility group and service category, FY 2011

Source: Analysis of Medicaid Statistical Information System data as reported in MACPAC (2014).

Notes: The LTSS is Long-Term Services and Support, and includes federal and state funds but excludes spending for administration, Disproportionate Share Hospital payments, the territories, and Medicaid-expansion CHIP enrollees. Children and adults under age sixty-five who qualify for Medicaid on the basis of a disability are included in the disabled category. About 706,000 enrollees age sixty-five and older are identified in the data as disabled. See MACPAC (2014, figure 3) for additional notes.

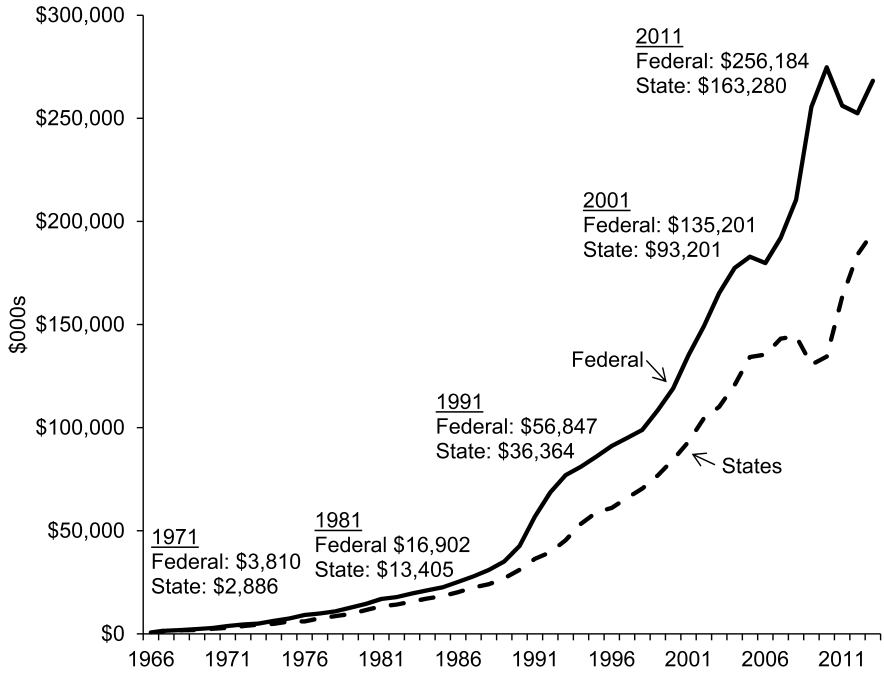

Fig. 1.6 Federal and state Medicaid expenditures, fiscal years 1966 to 2012
Source: National Health Expenditure Data, CMS (2014).

the last fifteen years Congress has temporarily increased FMAPs to provide fiscal relief to the states. In 2003, it increased the matching rates by nearly 3 percent as part of the Jobs and Growth Tax Relief Reconciliation Act. Congress increased FMAPs even more in 2009 as part of the American Recovery and Reinvestment Act (ARRA), which included $87 billion for a temporary increase in the FMAP.[13] Under ARRA, all states received at least a 6.2 percent increase in their FMAP; states that had experienced large increases in unemployment since 2006 received an additional reduction in their share of program spending. The temporary FMAP bump expired in 2011, and in 2012 the federal share of total Medicaid spending was down to 56.5 percent.

1.3.2 Provider Reimbursement

The amount that Medicaid pays providers varies across states and over time. Table 1.5 summarizes some of the variation in physician reimbursement rates. The figures come from several studies by Stephen Zuckerman

13. The ARRA also provided federal funds for states to provide incentives for eligible Medicaid providers to purchase and implement certified electronic health records (MACPAC 2012).

Table 1.5 **Ratio of Medicaid physician fees to Medicare fees, composite fee index for selected years**

	2003	2008	2012
National average			
All services	0.69	0.72	0.66
Primary care	0.62	0.66	0.59
Obstetric care	0.84	0.93	0.78
Other services	0.73	0.72	0.70
Distribution of ratio for all services by state			
Minimum	0.35	0.37	0.37
Median	0.80	0.88	0.77
Maximum	1.37	1.43	1.34
States with Medicaid/Medicare ratios:			
Less than 0.50[a]	3	3	2
0.50 to .75	18	14	19
0.75 to 1.0	26	23	27
Greater than 1.0	4	11	3

Source: Zuckerman et al. (2004); Zuckerman, Williams, and Stockley (2009); Zuckerman and Goin (2012).

Notes: Data represent the national average of Medicaid-Medicare fee indexes within given categories. Underlying source data is from the Urban Institute Medicaid Physician Fee surveys.

[a]Categories are inclusive of lower boundary.

and colleagues, who collected data on Medicaid fees for different services (Zuckerman et al. 2004; Zuckerman, Williams, and Stockley 2009; Zuckerman and Goin 2012). To provide a sense of how Medicaid compares to other payers, the reimbursement rates are expressed as a percentage of Medicare rates, which tend to be lower than private fees. The top panel reports the national average Medicaid/Medicare ratio by broad-service category. Considering all services, in 2003 Medicaid physician fees were 69 percent of Medicare fees. The national average increased to 72 percent in 2008 before falling to 66 percent in 2012. In general, Medicaid fees tend to be higher relative to Medicare for obstetric services and lower for primary care.

The bottom panel of the table gives a sense of the variation across states. In each year, the large majority of states pay physicians between 50 percent and 100 percent of what Medicare pays. Several of the states that pay more than Medicare are sparsely populated states with small Medicaid programs: Alaska and Wyoming in all three years and Idaho, Montana, Nebraska, Nevada, New Mexico, and North Dakota in 2008. At the other end of the spectrum, New Jersey and Rhode Island were the two lowest-paying states in all three years, with rates that were between 35 and 42 percent of Medicare, depending on the year. New York, which has the second largest program in terms of total enrollment, has historically also had low Medicaid rates. In 2008, New York's rates were the third lowest of all states at 43 percent

of Medicare rates. In 2012, New York's Medicaid fees were 55 percent of Medicare's. California, which has roughly twice as many Medicaid enrollees as New York, has also historically had low reimbursement rates. In 2012, California paid 51 percent of Medicare rates on average.

The data summarized in table 1.5 pertain to Medicaid and Medicare patients for whom physicians are paid on a fee-for-service basis. One response states have made to the substantial budgetary pressure of Medicaid has been to encourage or require recipients to enroll in managed-care plans. As noted in section 1.2, since the early 1990s both programs have seen a significant growth in the percentage of patients who are covered by managed-care arrangements. As shown in figure 1.7, Medicaid managed-care penetration grew from 9.5 percent in 1990 to 56 percent by the end of that decade. Since then, the share of Medicaid enrollees in managed care has continued to grow, though less rapidly. By 2012, roughly three-quarters of Medicaid beneficiaries were in some form of managed care.

Recall that in the context of Medicaid, the term managed care encompasses several different types of arrangements, including comprehensive risk-based plans that received a fixed payment per member per month—that is, HMOs—as well as primary care case-management programs that pay primary care providers a monthly fee to coordinate the care of enrollees. The prevalence of these arrangements varies across eligibility categories. In FY2010, 87 percent of children were covered by managed care; 62 percent

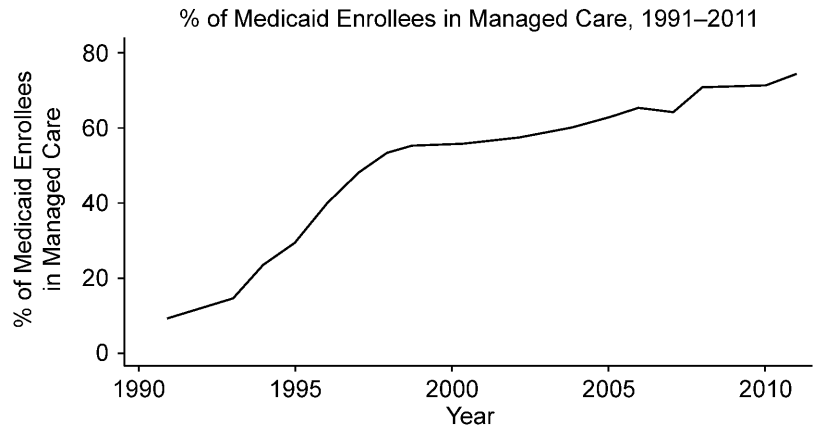

Fig. 1.7 Percent of Medicaid beneficiaries enrolled in managed-care plans, 1991–2011

Source: Medicaid Manage Care Enrollment Reports 1996, 2006, 2011.

Note: Medicaid enrollee population represents point-in-time enrollment as of June 30 for each reporting year; 1995 Medicaid enrollee population is an average over the entire year; the 1996 total Medicaid population was collected by states at the same time the managed-care enrollment data was collected instead of through HCFA-2082 reports, as was the practice in previous years.

of all Medicaid children were in a comprehensive risk-based plan.[14] Among nondisabled adults, 60.5 percent were in some form of managed care, including 46.8 percent in a risk-based plan. The disabled were slightly more likely to be in some form of managed care (63.1 percent), but much less likely to be enrolled in a comprehensive plan (28.7 percent). The aged were least likely to be in managed care overall: in 2010 40.6 percent were covered by a managed-care arrangement and 11.9 percent were in a comprehensive plan.

1.4 Review of Issues

Unsurprisingly, given the magnitude of expenditures on the Medicaid program and the sizable number of recipients, Medicaid has garnered substantial research interest covering a variety of areas.[15] An important area of research focus is the effectiveness of the program and its design, including examinations of whether Medicaid is accomplishing its intended goals of improving access to timely and appropriate medical care, improving health, and reducing the financial impact of health shocks. Research in this area has examined the impact of Medicaid eligibility and Medicaid coverage as well as the impacts of particular policy elements, such as reimbursement policy, on program effectiveness. A smaller but growing number of studies investigate the effect of Medicaid on other aspects of individual well-being, including financial well-being. There has also been an important research focus on the unintended consequences of Medicaid and its design for beneficiaries and providers, including issues of crowding out of other sources of insurance, labor supply, and provider financial impacts. In addition, the structure of the program and its relation to other means-tested programs has given rise to research on program interactions.

1.4.1 Program Take-Up and Crowd-Out

A key question in considering the impact of Medicaid is whether it is reaching individuals whom it is intended to help. As discussed above, for much of Medicaid's existence it accompanied cash assistance receipt, and thus take-up of the program was intertwined with take-up of cash assistance. However, the delinking of Medicaid from cash assistance for many eligibility groups means that take-up of Medicaid coverage can be considered separately. Moreover, Medicaid is an in-kind benefit that may duplicate insurance an eligible individual could potentially obtain privately, raising the possibility of crowding out of private health insurance. Crowding out, or the effect of public insurance availability on the propensity to have private coverage, has complex implications for individual and social welfare. For

14. Figures on managed-care enrollment by eligibility category are from MACPAC (2013, table 17).

15. The literatures on these various outcomes are large, including many more studies than we are able to cite in this review.

an individual family that is able to obtain health insurance at a significantly reduced out-of-pocket cost through Medicaid, crowding out represents a transfer of resources to that family, allowing an increase in consumption of other goods. At the societal level, such a transfer represents increased government expenditure, with the attendant deadweight losses of taxation. Moreover, transfers in the form of health insurance provision may be valued by recipients more or less than an equivalent expenditure on cash-based transfers. In addition, the interaction of Medicaid with markets for health care services and health insurance and the relationship between health insurance and employment makes the implications of crowding out even more complicated. The literature studying crowding-out and take-up has thus tended to focus on measuring the extent of these responses rather than estimating their relative costs and benefits.[16]

Simple theoretical models of take-up and crowd-out such as those discussed in Cutler and Gruber (1996) and Ham, Ozbeklik, and Shore-Sheppard (2014) suggest that an eligible family will compare the benefits and costs associated with participating in Medicaid with the benefits and costs of private insurance and will choose public coverage, private coverage, or both based on which choice maximizes utility. Take-up is defined as the enrollment response to eligibility, with estimates of take-up differing depending on whether an average take-up rate (that is, the average rate of enrollment among all eligible individuals) or a marginal take-up rate (that is, the rate of enrollment among an individual made newly eligible) is being calculated.

The basic idea of crowd-out is simple: the availability of public insurance will lead some families to substitute that coverage for private coverage. However, in practice there are multiple conceptions of crowd-out and multiple ways to measure it, leading to some confusion about which are comparable and which are not. One simple measure of crowd-out asks how making an individual eligible for Medicaid affects his or her probability of having private coverage. This measure has the advantage of being symmetric with the marginal take-up rate. In addition, it can be estimated directly along with its standard error. Another measure rescales estimates of the private response to eligibility by the take-up response to eligibility, measuring crowd-out as the reduction in private insurance coverage associated with an increase in Medicaid coverage. This measure has the characteristic that two equivalent private coverage responses to eligibility would produce different magnitudes of crowd-out, with crowd-out considered to be larger

16. While a full comparison of the costs and benefits of Medicaid to individuals and to society would be useful for evaluating Medicaid, such welfare analyses have generally not been done for Medicaid due to the difficulties inherent in valuing it, particularly the information required to conduct such an evaluation. An important exception is a recent paper by Finkelstein, Hendren, and Luttmer (2015), who conduct a welfare analysis of Medicaid provision in the context of experimental provision of insurance to low-income adults known to be uninsured. Even in this relatively straightforward context, and with a rich set of experimentally generated data, analyzing the welfare implications of Medicaid is quite challenging.

when the public coverage response to eligibility was smaller.[17] Another measure of crowd-out is the difference between the fraction of eligible children who would have private coverage if they were (counterfactually) not eligible and the fraction of those children who actually have private coverage. Still other measures use longitudinal or administrative data to look at explicit transitions out of private coverage, measuring crowd-out as the transition rate out of private coverage with eligibility.

An important concern for researchers interested in estimating take-up and crowd-out is the likely endogeneity of eligibility. This potential endogeneity arises because unobservable factors affecting eligibility are likely to be correlated with unobservable factors affecting health insurance choices, for example, attitudes toward participation in public programs, the wages and fringe benefits of jobs held by eligible and ineligible individuals, and factors affecting relative costs of obtaining private insurance or enrolling in Medicaid. Similar endogeneity concerns arise in studies of the effect of Medicaid on other outcomes. We discuss how researchers have dealt with eligibility endogeneity below when we outline the strategies researchers have used for identifying causal estimates.

1.4.2 The Effect of Public Health Insurance on Health Care Utilization and Health Status

The effect of gaining Medicaid coverage on health care utilization and health status will depend on an individual's insurance coverage and access to care prior to enrolling in the program. Relative to being uninsured, Medicaid lowers the out-of-pocket cost of all types of care. The main effect of this cost reduction will be to increase utilization, though it is possible that increased use of certain types of care may result in reduced use of others. For example, improved access to primary and preventive care may lead to health improvements that reduce hospitalizations. There is, therefore, a great interest among health services researchers in the relationship between insurance coverage and "avoidable" or "ambulatory-care-sensitive" hospital admissions. Health care utilization is less likely to increase for individuals who drop private coverage to enroll in Medicaid. In fact, because Medicaid reimbursement rates are so much lower than rates paid by private insurers, such individuals may experience reduced access to care, particularly care involving costly technologies. Consequently, the impact of Medicaid on utilization in the presence of substitution is an empirical question.

Although there is much interest in understanding how insurance coverage affects health, measuring health outcomes can be challenging. Studies focusing on ambulatory-care-sensitive hospital admissions often interpret

17. This ratio measure also has the problem that researchers who report it rarely provide a standard error for this measure, and it is not possible to calculate one just from the standard errors on the individual estimates.

reductions in such utilization as an improvement in health. Other studies have examined the impact of Medicaid on health directly, looking at outcomes such as blood pressure and other clinical measures of health, infant birth weight, infant or child mortality, or self-reported health status.

1.4.3 Impacts on Health Care Providers

The impact of Medicaid coverage on utilization of care and health will also depend on the willingness of different types of providers to supply services to Medicaid patients, which will depend on how Medicaid payment rates compare to what providers are paid for patients with Medicare and private insurance (Sloan, Mitchell, and Cromwell 1978). As shown in table 1.5, Medicaid fees vary across states and over time, but in general tend to be substantially lower than those for other payers. In 2011–2012, roughly 30 percent of all physicians did not accept new Medicaid patients (Decker 2013).

The effect of eligibility expansions on physicians and other providers will depend on the mix of patients they were treating prior to the expansion, the degree of crowd-out and how Medicaid payment rates compare to those of other payers. When there is little or no crowd-out, the main effects of an eligibility expansion will be on physicians who were previously treating low-income patients, including both those with Medicaid and the uninsured. Providers specializing in treating privately insured patients will be less affected. In contrast, when eligibility expansions induce a substitution of public for private insurance, many providers, including those that were not previously treating Medicaid patients, will experience the expansion as a reduction in payment rates for patients they are already seeing.

Changes in fees, whether they arise implicitly through crowd-out or directly from a change in a state's fee schedule, will have both substitution and income effects. Some research on Medicare suggests that for that program income effects are important; physicians respond to reductions in Medicare payment rates by increasing the volume of services provided (see McGuire [2000] for a good review). Such a response is less likely in the case of Medicaid given that Medicaid patients represent a smaller share of the patients seen by most physicians in private practice. When the substitution effect dominates, physicians will respond to a decrease in Medicaid fees by reducing their supply of services to Medicaid patients.

Medicaid eligibility and payment policies affect incentives for providers to invest in and use medical technology. When Medicaid accounts for a large share of patients for particular services, as is the case with obstetric care, hospitals will have less incentive to invest in costly technology, such as neonatal intensive care units, and physicians will have less incentive to provide more costly treatments.

In addition to financing roughly half of all births, Medicaid pays for a large share of nursing home care in the United States. In 2011, Medicaid was

the primary payer for over 60 percent of all nursing home residents (Kaiser Commission on Medicaid and the Uninsured 2013). Therefore, Medicaid payment policy has important implications for the quality of nursing home care, though the relationship between payment rates and quality is complex. When supply-side regulations limit capacity and quality is a common good that is experienced equally by all patients in the same facility, an increase in Medicaid payments could possibly lead to a reduction in quality (Nyman 1985; Gertler 1989). The reason for this counterintuitive result is that higher payment rates will cause nursing homes to attract more Medicaid patients. Homes that were already at full capacity will therefore want fewer private-pay patients, causing them to raise price and lower quality to private-pay patients. This result relies on the existence of strict capacity constraints, which were important features of the market in the 1970s and 1980s, but have been less relevant more recently. Indeed, as we discuss below, the best evidence from recent studies is that higher Medicaid payments lead to higher-quality care.

1.4.4 Impacts on Labor Supply and Other Program Participation

From the beginning of its history Medicaid has been linked to cash assistance programs, with participation in these other programs leading to eligibility for Medicaid. When participation in a cash assistance program yields health insurance benefits as well as cash, participants would be even less likely to work than if they only received the cash payment. The Medicaid expansions of the late 1980s and onward that separated the receipt of Medicaid benefits from welfare participation meant that individuals would be less likely to choose not to work, since they could still obtain Medicaid while working. The effect of the expansions on hours is ambiguous as some parents who were working may cut their hours to qualify for Medicaid.

The potential effect of the ACA Medicaid expansion is also complex. As an effective increase in unearned income, the availability of Medicaid coverage should reduce hours of work and lower participation rates. However, the availability of subsidized private insurance for individuals and families with incomes above the FPL should reduce the incentive for workers to cut their hours in order to qualify for Medicaid. (And in states choosing not to expand Medicaid, some low-income workers will have an incentive to increase hours to qualify for private insurance subsidies.)

1.4.5 Impacts on Family Structure

There are several possible channels through which Medicaid may affect family structure. The link between AFDC eligibility and Medicaid for poor children that existed for the first twenty years of the program, and the fact that AFDC eligibility in most states was limited to single parents (effectively, single mothers) meant that marriage deprived a woman not only of an income source, but also of health insurance for herself and her children.

While marriage presumably replaced potential AFDC income with potential spousal earnings, the need to obtain health insurance for the entire family as well may have dissuaded some individuals from marrying. Thus by making eligibility for Medicaid for one's children not conditional on marital status, it is possible that the Medicaid expansions that began in the 1980s had the effect of encouraging marriage.

Medicaid might also impact family structure by affecting fertility decisions. In the framework developed by Becker (1960) and Becker and Lewis (1973), both the quantity and quality of children enter the mother's utility function. Thus covering the costs of prenatal care, delivery, and infant care lowers the price of quantity, inducing substitution in favor of quantity and causing a rise in fertility. In addition, Medicaid could also reduce miscarriages through better prenatal care. Since in this model the shadow price of children with respect to quantity is positively related to the level of quality, and vice versa, the theoretical impact of the expansions on fertility is not unambiguously positive. Expanding Medicaid to cover additional low-income children lowers the price of quality, which may lead to lower birth rates.

Another possible effect of Medicaid on fertility is the effect of Medicaid on the price of ending a pregnancy or preventing conception. Following the Hyde Amendment of 1976, federal funding of abortion under the Medicaid program was restricted to cases in which the mother's life is in danger. States have the option to cover abortions in their Medicaid program, but will not receive the federal match for them. Medicaid has covered the cost of family-planning services since 1972, and CHIP covers family-planning services for adolescents. In addition, beginning in the mid-1990s the federal government granted a number of states Section 1115 waivers to offer family-planning services under Medicaid to higher-income women or to women who otherwise would have lost Medicaid eligibility, typically postpartum. While it may seem clear that reducing the price of ending a pregnancy or preventing conception will reduce fertility, interactions between take-up, existing private provision of such services, and changes in sexual activity resulting from the change in the price make the fertility implications of such policies unclear (Kearney and Levine 2009).

1.4.6 Impacts on Financial Well-Being

There are a number of ways in which Medicaid may impact a family's financial circumstances. Because Medicaid insurance is generally offered below the fair insurance price, it can be thought of as a transfer that improves the economic circumstances of the individual through the reduction in medical insurance costs and out-of-pocket expenses that would otherwise be incurred. Medicaid also helps families avoid catastrophic losses and bankruptcies due to extreme medical expenses.

Medicaid may also affect family savings through four possible channels.

First, by reducing uncertainty about future medical expenses, Medicaid reduces the need for precautionary saving. Thus eligible households would be expected to save less (and therefore have lower assets) compared with ineligible households, all else being equal. However, to the extent that households do not expect to qualify for Medicaid indefinitely, the effect of this channel would be lessened. Second, the redistributive feature of Medicaid increases a household's available resources, and if the household's marginal propensity to save is greater than zero, this increase could lead to higher levels of asset holdings. The third channel by which the Medicaid program may affect savings levels is through the asset test that has applied to various parts of the program at various times: households might reduce their wealth holdings in order to qualify for insurance. Finally, Medicaid protects eligible families from health shocks that can drive families into debt and bankruptcy. The current research in this area has generally focused on how family medical debt, nonmedical debt, and family bankruptcy are affected by Medicaid expansions; available research indicates that it reduces a family's medical debt and probability of going into bankruptcy. In this way, Medicaid may increase a family's assets.

1.4.7 Strategies for Identifying Causal Effects

Empirical studies of all of the above questions generally aim to estimate causal effects. However, given the means-tested nature of the program, there is a fundamental challenge for research in this area as in other areas of policy evaluation: endogeneity of eligibility, enrollment, and utilization. This endogeneity arises because unobservable factors affecting eligibility for the program such as earnings ability, unobserved aspects of employment, availability of insurance from other sources, and unobserved health status, are likely to be correlated with unobservable factors that affect outcomes of interest such as health insurance choices, public program participation, and labor supply. In addition, it may be difficult to control entirely for all of the factors determining both eligibility and the outcome of interest, such as varying insurance markets, changes in the economy, and changes in the supply of providers of various types.

Due to this endogeneity, merely attempting to control for as many observable differences between groups eligible and ineligible for Medicaid as possible is unlikely to produce compelling estimates of the program's effects. Researchers working on examining the impact of Medicaid on a variety of outcomes have recognized this issue and have used a number of identification strategies to try to obtain credible empirical estimates of the program's effects. These identification strategies have taken advantage of variation arising from the fact that Medicaid parameters differ in every state. Moreover, these parameters can vary within a state either geographically (as states implement changes in one place but not in another, for example), by other subgroups in the population (by age, for example), or over time because of

a policy change at the state or federal level. The variation used can be truly random, as in the experiment extending Medicaid to a subset of low-income adults in Oregon determined by lottery discussed below, or more commonly, quasi-random. Below we give a general sense of how identification is accomplished in studies of Medicaid and some important benefits and drawbacks of each approach generally; we leave a more complete discussion of the details of specific papers to the following section.

Randomized Experiment

Arguably, the strongest research design for estimating causal effects is a randomized experiment, since by design there is no correlation between individual characteristics and the policy of interest. While randomized experiments are rare in Medicaid research, an important experiment, the Oregon Health Insurance Experiment, is providing insights into key Medicaid policy questions (see, e.g., Finkelstein et al. 2012; Baicker et al. 2013). In early 2008, Oregon decided to make 10,000 additional places in its Medicaid program for low-income adults newly available. Knowing that there were insufficient funds to cover everyone who would want to enroll, the state applied for permission to use a random-assignment mechanism. Approximately 90,000 people signed up for the reservation list, and the state ran a randomized lottery on that group to determine which individuals would be permitted to apply for coverage. Individuals chosen in the lottery were allowed to apply, and all selected individuals who filled out and returned the application and who were found to be income eligible were enrolled.[18]

The researchers on the study matched an impressive wealth of data from hospital discharge records, credit records, prerandomization demographics from the sign-up list, and a follow-up survey of outcomes. Before looking at the data on outcomes for the treatment group, most analyses were prespecified and publicly archived in order to minimize concerns about data and specification mining. Since the population that received coverage through the experiment is basically the same as the population gaining eligibility through the ACA, there is a high degree of external validity with respect to that policy.

Quasi-Experiments

Other studies in the literature exploit quasi-experimental variation arising from the fact that income eligibility limits, provider reimbursement rates, and other important program features vary across states. Changes in state and federal policy create additional variation over time. Eligibility rules

18. Not all of the individuals chosen in the lottery obtained Medicaid coverage; according to Finkelstein et al. (2012) "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."

based on age create additional variation within state/year cells. Studies in the literature exploit these different "natural experiments" in various ways.

Regression Discontinuity In recent years, regression discontinuity (RD) techniques have become a standard component of the empirical economist's toolkit for estimating program effects. Such models rely on the existence of a known cutoff or threshold in a variable (known as the "assignment" variable) with different conditions occurring for observations falling on either side of it. As long as individuals are unable to control precisely the assignment variable near the known cutoff, the RD design isolates treatment variation that is "as good as randomized" (Lee and Lemieux 2010). The examination of Medicaid, with its various eligibility cutoffs of different kinds, would seem to be a fruitful place to use an RD design, and indeed several studies have used such an approach to estimate the impact of Medicaid eligibility on insurance coverage and utilization. For example, Card and Shore-Sheppard (2004) use various discontinuities in eligibility arising from the fact that eligibility under some expansions was extended only to children of certain ages. In one formulation, they use the discontinuity in eligibility between children born before October 1, 1983, who had to meet the AFDC eligibility requirements in order to be eligible and children born after that date, who could be in two-parent families and have family income as high as the poverty level. The inability to control birthdate around that cutoff (particularly since that birthdate cutoff was not established prospectively) makes it a compelling research design.

Researchers have also applied RD methods to income cutoffs (see, e.g., de la Mata 2012; Koch 2013), although the imperfect control assumption requires more justification in the case of income. In addition, income is measured with considerably more error than birth date, and even if it is measured well, income at the time of the survey may not be the same as income at the time an individual applies for coverage. Even more importantly, as discussed above, prior to the ACA each state had complicated rules about disregards that changed the actual level of the income limits making the determination by the researcher of the correct income limit to apply to income observed in the data more difficult.

Difference-in-Differences Several variants of a difference-in-differences (DD) research design have been used to estimate the effect of Medicaid policies. General methodological issues related to DD models have been discussed extensively elsewhere (see, e.g., Meyer 1995; Bertrand, Duflo, and Mullainathan 2004), so here we highlight the way different authors have used DD methods to leverage various sources of variation in the Medicaid program.

Given the latitude that states have in determining program parameters, an important source of variation is differences across states. For example, Gray

(2001) uses a cross-sectional DD model to estimate the effect of Medicaid physician fees on several birth outcomes. In this model, pregnant women on Medicaid are the treatment group and other pregnant women are used as a comparison group. Specifically, his regression models include a measure of Medicaid fees, an indicator variable for Medicaid coverage and the interaction of the two. Choi (2011) takes a similar approach to study the effect of adult dental benefits. The identifying assumption underlying this approach is that state-level differences in Medicaid fees or dental benefits should matter for Medicaid enrollees but not for other individuals in the state. An obvious limitation of this approach is that state Medicaid policy may be correlated with other unmeasured factors affecting the outcome, leading to biased estimates.

Other studies have used a DD strategy to compare changes over time for groups that were subject to a change in Medicaid policy to control groups who should have been unaffected, or at least less affected. The simplest application of this approach compares outcomes in two periods, "pre" and "post," for two groups, a "treatment" group that was the target of a policy change and a "control" group that should have been unaffected, or at least less affected. For example, to estimate the coverage effects of the Medicaid expansions of the late 1980s and early 1990s, Dubay and Kenney (1996) compare changes in coverage for low-income women and children, for whom income eligibility thresholds increased, with changes for low-income men, who were not the target of the eligibility expansions. In these models, identification is based on the assumption that in the absence of the Medicaid expansions, the outcomes studied would have common trends across treatments and controls.

These simple DD models do not take advantage of variation within states in eligibility rules or other program parameters. To take advantage of such variation, researchers have turned to triple difference models, with, for example, treatment and comparison groups within a state over time. For example, Garthwaite, Gross, and Notowidigdo (2014) compare insurance coverage among childless adults to other adults in Tennessee and other southern states before and after a Medicaid policy change in Tennessee that affected childless adults more than parents. Alternatively, policies may be more likely to apply to certain geographic areas within a state. For example, Aizer (2007) studies the impacts on Medicaid enrollment of community-based outreach organizations that were placed in some areas of California, but not in other areas at different times. The key identifying assumption in such models is that the trends would have been the same for treatment and control groups within a state in the absence of the policy.

Instrumental Variables An alternative to the difference-in-differences approach that also utilizes variation arising from policy changes to identify causal effects is to use policy variables as instrumental variables. The

most widely used instrumental variables approach in the Medicaid literature is the "simulated eligibility" instrument that was pioneered by Currie and Gruber (1996a, 1996b) and Cutler and Gruber (1996) and has been used in many papers since then. The idea of this approach is to summarize the exogenous variation in Medicaid eligibility by determining the fraction of a given sample that would be eligible for Medicaid under the rules applying in a particular state at a particular time. This requires detailed knowledge of the rules for Medicaid eligibility so that the eligibility for any individual in a sample can be determined based on his or her observable characteristics. In order to remove the effects of any state and time-specific economic conditions that might be correlated with both eligibility and the outcome of interest, the fraction eligible is typically determined for a random sample at the national level, and often for a fixed time period as well. This simulated fraction eligible, which is essentially an index of the expansiveness of Medicaid eligibility for each subgroup in each state and time period, can then be used as an instrument for actual (imputed) eligibility at the individual level (as in the original papers by Currie and Gruber and Cutler and Gruber) or at an aggregated (cell) level (as in Dafny and Gruber 2005).[19]

The simulated eligibility instrumental variables approach typically involves estimating a linear probability model (LPM) for the outcome of interest as a function of public insurance eligibility (*elig*), which is imputed to individuals (*i*) on the basis of observed characteristics and the eligibility rules in place for a given state and time period (*t*):

$$\text{Outcome}_{itk} = X_{it}\beta_k + \gamma_k elig_{it} + u_{itk},$$

where *k* denotes the particular outcome of interest, *X* is a vector of additional variables affecting the outcome, and *u* is an error term. In this framework, the effect of eligibility generally is assumed to differ across individuals and resulting coefficients on $elig_{it}$ are best interpreted as local average treatment effects (LATEs)—effects for individuals whose eligibility is affected by marginal changes in the instrument, averaged across the different marginal changes present in the data. So for example, when public coverage is the outcome of interest, the coefficient on $elig_{it}$ represents the average take-up rate among individuals made eligible, and when private coverage is the outcome of interest the coefficient is the average rate of loss of private coverage among individuals made eligible. The ratio of the latter coefficient to the former is thus the rescaled measure of crowd-out discussed earlier.

This instrument has many benefits, as its widespread adoption makes clear: it is a useful way to summarize complicated program rules in a simple but meaningful index, it is arguably exogenous along several dimensions,

19. Simulated eligibility has also been used in reduced-form models as an arguably exogenous index of availability of Medicaid (see, e.g., DeLeire, Lopoo, and Simon 2011).

and it has a very strong first-stage relationship with imputed eligibility. However, there are some issues that researchers who use this approach (and also the difference-in-differences methods discussed above) must consider. One is policy endogeneity: it is possible that government policy targets groups experiencing worse economic conditions or occurs in response to other factors potentially correlated with the outcome of interest, making state expansions potentially endogenous. This is a particular concern for research examining later expansions that occur purely at state initiative and arguably a smaller concern for research focusing on changes in eligibility that occurred in response to federal requirements. It is also possible that groups experiencing worse economic conditions happened to be those particularly affected by the expansions, even though the legislation was not intentionally aimed to mitigate economic conditions for these groups (Shore-Sheppard 2008). To try to account for such issues, researchers typically include state effects to account for differences across states unrelated to the expansions, time effects to control for macroeconomic shocks and economy-wide trends, and age effects to account for differences by age unrelated to the expansions. Even these fixed effects may not be enough to account for differential trends across ages or states, and if such trends are important, convincing identification may require the inclusion of two-way interactions between age, state, or time to account for them (Shore-Sheppard 2008). Even including such interactions may be insufficient if, for example, states are targeting policy at particular groups in the population in response to changes in the outcome of interest for those groups.

Finally, mismeasurement (in income, for example) or the absence of information in the data about other characteristics that would result in eligibility via other paths (such as high medical expenses that would lead to medically needy eligibility or disability) may lead to misclassification of eligibility status (Hamersma and Kim 2013). While many authors using eligibility status have noted the problem, some have suggested that using simulated eligibility as an instrument would mitigate the problem. Unfortunately, as measurement error in a binary variable cannot be classical in the sense of being uncorrelated with the true value, an IV strategy will not produce consistent estimates of the parameter of interest but may instead produce an upper bound (Black, Berger, and Scott 2000).

Another methodological issue is that as Ham, Ozbeklik, and Shore-Sheppard (2014) point out, this framework has several limitations if one is interested in heterogeneity in the response to the policy or in the effects of nonmarginal changes, and in addition the LPM approach allows an individual to have a positive probability of having public insurance even if he or she is not eligible for it. They suggest an alternative framework to deal with this issue and obtain estimates of heterogeneous effects or the effects of nonmarginal changes (discussed further below). However, their alternative

approach relies on the same intuition as the simulated approach: since the rules determining Medicaid eligibility are observable, they can be used to determine who in the sample is affected by changes in policy.

1.5 Review of Research Evidence on Impacts of Medicaid

1.5.1 Eligibility, Take-Up, and Crowd-Out

Estimates for Children

A number of studies have investigated how changes in Medicaid eligibility policy affect insurance coverage, with the primary focus being changes in eligibility affecting children. One set of papers focuses on the Medicaid expansions of the late 1980s and early 1990s, while other studies consider the effect of CHIP. In addition to examining the relationship between eligibility and enrollment (take-up), these studies also estimate the effect of program eligibility on private insurance coverage (crowd-out). Table 1.6 lists studies of take-up and crowd-out, focusing primarily on studies that have been done since the Gruber (2003) review and studies done prior to the review that were instrumental in informing the research that came later.[20]

The seminal paper in the literature on Medicaid take-up and crowd-out is Cutler and Gruber's (1996) study on the effect of the eligibility expansions of the late 1980s and early 1990s. Using Current Population Survey (CPS) data for the period 1988 to 1993, they estimate linear probability models of Medicaid coverage and of private coverage as a function of eligibility using the simulated eligibility instrument discussed in the above section on instrumental variables. As noted above, the instrument is essentially an index of the generosity of Medicaid eligibility for each age group in each state and year. It is correlated with individual eligibility for Medicaid but not otherwise correlated with the demand for insurance, assuming that changes in a state's Medicaid provisions are not correlated with changes in the state's availability or price of private insurance.

In this framework, the coefficient on eligibility in the Medicaid equation can be interpreted as the average take-up rate among individuals whose eligibility is affected by marginal changes in the instrument, while the coefficient in the private equation represents the average private coverage response among these individuals. Cutler and Gruber estimate this local average take-up rate to be 24 percent and the corresponding effect of eligibility on private insurance to be 7 percent, both of which are statistically significant. As noted above, this effect on private coverage can be interpreted as a measure of crowd-out. However, Cutler and Gruber suggest scaling

20. In the table we note standard errors of estimates where they are known and correctly calculated, although we omit them from the discussion of the studies below in the interest of space.

Table 1.6 **Studies of eligibility, take-up, and crowd-out**[a]

Study	Data	Population	Design	Results
Cutler and Gruber (1996)	1988–1993 March CPS	Children, women of childbearing age	IV using simulated eligibility instrument. Dependent variables: private coverage, public coverage, and uninsured. Main independent variable: imputed eligibility. Variation exploited: Medicaid expansions.	For marginal eligible children: take-up 23.0 percentage points (pp.) (1.7), private decline 7.4 pp. (2.1), implies ratio of private decline to take-up 31.5 percent (s. e. not calculated),[b] uninsured decline 11.9 pp. (1.8). Women: no statistically significant changes in coverage.
Card, Hildreth, and Shore-Sheppard (2004)	SIPP and the Medi-Cal eligibility data system	Individuals in California eligible for Medicaid (children & adults)	Use administrative data to determine measurement error in SIPP reporting of Medicaid coverage.	SIPP underestimates Medicaid coverage by 10 percent. The probability of correctly reporting coverage in the SIPP for those actually covered by Medicaid is around 0.85. The probability that people who are not covered by Medicaid incorrectly report in the SIPP that they are covered is about 0.013 for the population as a whole.
Card and Shore-Sheppard (2004)	Separately use 1990–1993 panels of SIPP, 1990–1996 March CPS, and the 1992–1996 Health Interview Survey (HIS)	Children at ages around the 1989 OBRA expansion and the 1990 OBRA expansion	Use a RD design to compare children above and below the age limits set by the 1989 OBRA. Use the same strategy for the 1990 OBRA.	Find the 1990 expansion significantly increased both Medicaid and overall coverage for children just inside the eligibility limits by 7–11 pp. Find small or no effects of the 1989 OBRA. Find little or no significant level crowd-out effects.
Lo Sasso and Buchmueller (2004)	CPS 1996–2000	Children younger than age eighteen	Allow children's Medicaid eligibility from the expansions to have a different effect than those eligible due to SCHIP on private coverage, public coverage, and uninsured. Test whether the waiting period for SCHIP in many states affects the effect of SCHIP eligibility on the dependent variables.	Find take-up of eligibility due to the expansions is equal to take-up due to SCHIP (of about 9 pp.) when they do not use state * time dummies, but only take-up of SCHIP eligibility is significant (11 pp.) when they allow for state * time dummies. Find high levels of ratio crowd-out. Find waiting period significantly reduces Medicaid coverage and increases private coverage.
Busch and Duchovny (2005)	1995–2002 Behavioral Risk Factor Surveillance System; CPS 1996–2002 March Supplement	Household heads with children (men are included). Use two samples eligible for Medicaid—all households and low-income sample	IV using simulated eligibility instrument. Dependent variables: private coverage, public coverage, uninsured, health care utilization. Main independent variable: imputed eligibility.	Full sample—public insurance increases by 11.5 (2.2), private insurance decreases by 0.7 pp. (2.6). No insurance decreases by 10.9 pp. (2.6). Ratio crowd-out is 0.061. Low income sample—public insurance increases by 14.8 pp. (3.4). Private insurance decreases by 3.5 pp. (2.7). No insurance decreases by 11.3 pp. (3.2). Ratio crowd-out is 0.236.

(*continued*)

Table 1.6 (continued)

Study	Data	Population	Design	Results
Ham and Shore-Sheppard (2005b)	SIPP 1986, 1987, 1988, 1990, 1991, 1992, and 1993 panels	Children	IV using simulated eligibility instrument. Dependent variables: private coverage, public coverage. Main independent variable: imputed eligibility. Allow for dynamics.	Within baseline specification: Eligibility leads to take-up of 11.8 pp. (1.0), private insurance falls by 0.6 pp. (1.4). Thus both ratio and level crowd-out estimates are very small. Take-up of Medicaid is increased the longer a child has been eligible. Estimate both short-run and long-run effects of eligibility and find that long term is considerably bigger.
Hudson, Selden, and Banthin (2005)	Medical Expenditure Panel Survey (MEPS) 1996–2002	Children	DD approach with two treatment groups: 1. Children targeted by SCHIP and children targeted by poverty-related Medicaid Expansions. IV estimation on 4 groups of children using a modification of simulated eligibility IV approach since direct application of Cutler-Gruber approach produced unstable estimates.	Diff-in-diff for treatment group 1: Medicaid insurance increased by 8.9 pp. (2.0), private insurance decreased by 5.0 pp. (2.3), no insurance decreased by 3.9 pp. (1.9). Diff-in-diff for treatment group 2: Medicaid insurance increased by 8.3 pp. (2.8), private insurance decreased by 2.4 pp. (2.8), no insurance decreased by 6.3 pp. (2.4). IV: take-up 7.1 to 26.5 pp. (all significant), private insurance coverage declines by 14.0 to –1.25 pp. (larger values significant), ratio crowd-out 0.527 to –0.205.
Wolfe et al. (2006)	Administrative panel data from Wisconsin	Single-mother welfare leavers	Ordinary probit (standard errors corrected) estimation and random effects probit of probability of coverage for cohorts of welfare leavers before and after BadgerCare was implemented in Wisconsin. They also do a DD using fact that some cohorts were always eligible upon leaving and others became eligible later.	Ordinary probit estimates: BadgerCare increased the public health care coverage of all adult leavers by 6 pp. (0.5) to 8.0 pp. (0.6). Random effects probit effects similar. DD estimates imply public coverage increased by 17.0 pp. to 23.4 pp. (all significant).
Gruber and Simon (2008)	1996–2002 SIPP	Children birth to eighteen years old, and parents nineteen to sixty-four years old	IV using two specifications. First uses usual eligibility measure, second uses the fraction of the family eligible. Each approach has its own simulated eligibility instrument. Dependent variables: only private coverage, only public coverage, both types, uninsured. Main independent variable: eligibility or fraction of children in the family eligible.	Single-child eligibility model: eligibility raises public insurance only by 5.5 to 7.2 pp. (both significant), decreases only private by 1.1 to 1.7 pp. (both insignificant), increases private and public by 0.8 to 1.5 pp. (only significant without interactions). Ratio crowd-out 0.2 to 0.37. Family eligibility model: going from 0 percent of children eligible to 100 percent of children eligible for the family raises only public insurance by 10.9 to 15.6 pp. (both significant), decreases only private by 6.6 to 12.2 pp. (both significant), increases private and public by 2.7 pp. (both significant). Ratio crowd-out 0.61 to 0.81.

Shore-Sheppard (2008)	CPS March supplements, 1988–1996	Children (age eighteen and younger)	Uses simulated eligibility IV. Adds state * time, time * age and age * time dummies separately and together. Considers separately the effect of later expansions (than those considered by Cutler and Gruber).	Finds Cutler and Gruber's results stable except when adds age * time dummies to the specification. Take-up coefficient falls by half to 14.5 pp. (2.5), private coefficient falls to 0.5 pp. (3.1), ratio crowd-out falls to 3.4 percent. Finds later expansions have much lower take-up and ratio crowd-out.
Ham, Li, and Shore-Sheppard (2009)	SIPP 1986–1996 panels	Children birth to eighteen years old	Use a linear probability model to estimate transitions from a child being covered by public insurance to not being covered by public insurance and vice versa. Explanatory variables: demographics, TANF introduction, economic conditions, and Medicaid income limits.	Find that higher eligibility limits increase both the transitions into, and out of, public coverage. The introduction of TANF increases the transition rate out of public insurance and reduces the transition rate into public insurance. A higher unemployment rate significantly lowers the transition rate out of public insurance, but does not significantly affect the inflow. Children from more disadvantaged backgrounds have both higher inflow and outflow from public insurance.
Finkelstein et al. (2012)	Oregon's Center of Health Statistics; survey conducted by the researchers	Nonelderly Adults	Analyzes Oregon Medicaid lottery that randomly determined eligibility to volunteers for Medicaid eligibility. Looks at how lottery affected Medicaid and private insurance coverage, that is, no endogeneity or measurement error issues with eligibility. Considers several different measures of coverage; primary focus is "ever on Medicaid during the first year of the experiment." Took place at the start of the Great Recession, which may limit the applicability of the results.	People selected by lottery have a 26 pp. (0.35) increase in the probability of ever being on Medicaid. Being a member of the treatment group lowered private insurance by 0.8 pp. (0.5), hence no evidence of level or ratio crowd-out.
Gresenz et al. (2012)	2002–2009 Annual Social and Economic Supplements (ASEC) of the (CPS)	Children in families between 200 percent and 400 percent of the poverty line.	IV using simulated eligibility instrument. Dependent variables: private coverage, public coverage, uninsured. Main independent variable: imputed eligibility.	The CHIP expansions lead to a 4.1 to 4.2 pp. increase in Medicaid coverage (significant at the 1 percent level), 0.14 to 0.19 pp. decrease in private insurance coverage (all insignificant at conventional testing levels) and a 2.26 to 2.31 pp. decrease in children with no insurance (significant at the 1 percent level). Thus both level and ratio crowd-out are trivial here.

(*continued*)

Table 1.6 (continued)

Study	Data	Population	Design	Results
de la Mata (2012)	PSID—CDS 1997, 2002, 2007 waves	Children who were between five and eighteen years old with family income close to Medicaid income limit (on either side of the limit).	RD design. Allows for different effects at lower and higher income limits; depends on assumption of no measurement error in income. Dependent variables: public coverage and private coverage	Because of the RD approach, has numerous estimates for each treatment effect. For the lower income thresholds, Medicaid eligibility typically increases public coverage by a statistically significant 25 pp.; for the higher income thresholds, Medicaid eligibility typically increases public coverage by a marginally significant 8 pp.; for the lower income thresholds, Medicaid eligibility typically reduces private coverage by a statistically significant 27 pp.; and for the higher income thresholds, Medicaid eligibility typically reduces private coverage by a statistically insignificant 8 pp.
Hamersma and Kim (2013)	1996, 2001, and 2004 panels of the SIPP data	Parents	Estimates coverage as a quadratic function of the Medicaid thresholds. Dependent variables: private coverage, public coverage, uninsured.	Finds that the linear term in Medicaid income limits is significant and positive for no insurance and public insurance equations, while the quadratic term in income limits is significant and negative for these outcomes. For private insurance, the linear term is negative and significant, but the quadratic term is insignificant.
Bronchetti (2014)	Restricted-access National Health Interview Survey for 1998–2009	Children in immigrant families and children of natives (estimated separately)	IV using simulated eligibility instrument. Dependent variables: private coverage, public coverage, uninsured. Main independent variable: imputed eligibility.	Estimates a take-up rate of 19.2 pp. (3.8) for all children in immigrant families and 7.4 pp. (1.9) for all children of natives. The effects for private insurance (level crowd-out) are –2.8 pp. (5.0) and –3.1 pp. (1.5) for children in immigrant families and children of natives, respectively.
Dague (2014)	Administrative data from Wisconsin	Children and nonelderly adults in Wisconsin who enrolled in Medicaid from March 2008 to September 2009	Uses an RD design to study the introduction of premiums in Wisconsin's Medicaid/BadgerCare program on duration of participation in the plan. Premiums increase with income, with sharp breaks in the premium at various income levels. Uses income as reported in administrative data, so measurement error is not a problem in implementing RD approach.	Finds introducing a premium of $10 decreases the probability of a six- and twelve-month continuous spell on Medicaid by 0.129 (0.021) and 0.118 (0.0203). Finds no effect of changes in further increases in premiums (of a similar size) as the family's income increases.

Garthwaite, Gross, and Notowidigdo (2014)	CPS March Supplement 2000–2007	Childless nonelderly adults	Use DD and triple differences to examine the effect of a large number of Tennessee childless adults being excluded from Medicaid coverage in 2005. In the DD they compare Tennessee relative to other southern states; in the triple differences they compare childless adults to adults with children in Tennessee.	For the DD the take-up and level crowd-out estimates are 4.6 pp. (1.0) and 1.7 pp. (1.2), respectively; the ratio crowd-out measure is 36.2 percent (26.8). For their triple differences, the take-up and level crowd-out estimates are 7.3 pp. (1.7), and 4.3 pp. (2.4), respectively; the ratio crowd-out measure is 59.5 percent (38.4).
Ham, Ozbeklik, and Shore-Sheppard (2014)	SIPP 1986, 1987, 1988, 1990, 1991, 1992, and 1993 panels	Children younger than age sixteen. For children who have missing interviews, the first spell of continuous interviews are used.	Derive a theoretical model of take-up and crowd-out that implies one should use a switching probit model to estimate the joint probability of eligibility, public insurance, and private insurance. Such a model allows take-up and private insurance to depend on observable and unobservable family characteristics. Propose method for estimating current (nonmarginal) crowd-out as well as the effects of nonmarginal increases in Medicaid eligibility.	Find very considerable differences across demographic groups, with take-up falling as family material well-being increases. Estimate current level crowd-out (private coverage decline for currently eligible children) at 4.86 pp. (1.27). For children made newly eligible via a counterfactual 10 percent increase in Medicaid income limits (relative to their 1995 levels), estimate take-up and level crowd-out at 25.6 pp. (0.67) and 8.0 pp. (1.76).

[a]In this and the following tables, papers are listed chronologically. Papers that appeared in the same year are then listed alphabetically.

[b]We refer to this as ratio crowd-out in the rest of this table. Level crowd-out is simply the coefficient on eligibility in the private insurance coverage equation.

the private decline estimate by the estimate of the public coverage increase to measure crowd-out as the ratio of these two coefficients, obtaining an estimate of crowd-out (measured as the reduction in private insurance coverage associated with an increase in Medicaid coverage) of 31 percent. One problem with this approach is that a standard error for the crowd-out measure is generally not provided and there is not enough information in the reported results to use the delta method to calculate the standard error.[21] This is important since in many cases the numerator (the response of private insurance to Medicaid eligibility) is insignificant and imprecisely estimated. Some authors use a common bootstrap procedure to calculate the standard errors for their crowd-out estimate. However, Woutersen and Ham (2013) show that the common bootstrap procedure produces inconsistent estimates of the standard error that can be too small. They derive a procedure to obtain consistent standard errors using the bootstrap, and in the cases that they analyze they find that these consistent estimates are much larger than those produced by the common bootstrap. Thus the standard errors in the literature for the ratio crowd-out estimates are likely lower bounds on the true standard errors.

Subsequent papers have reexamined the effect of these same eligibility expansions using different data and methods. Shore-Sheppard (2008) investigates a number of critiques leveled at the Cutler and Gruber paper, using CPS data for a slightly longer period (1988–1996) and the same basic framework. Using the same data, she finds that the results are not qualitatively affected by extending the sample period or by adding state × year and age × state dummies. However, when she adds age × year dummies, either by themselves or with the other interactions, she obtains smaller estimates of take-up (between 15 and 19 percent, depending on whether other interactions are included) and crowd-out (the estimated rate of crowd-out with eligibility is between 0.5 percent and 1.2 percent, with larger standard errors). She also finds lower take-up rates when later expansions are included and small "wrong-signed" effects on private coverage.

Ham and Shore-Sheppard (2005b) replicate Cutler and Gruber's analysis using data on children from the 1986–1993 panels of the Survey of Income and Program Participation (SIPP), which has several advantages relative to the CPS, including the fact that the reference period for the insurance question is clearer and the period over which the respondent is asked to recall information is much shorter. Compared to Cutler and Gruber, they obtain smaller estimates of the marginal take-up rate (12 percent) and the effect of eligibility on private coverage (a fall of 0.6 percent), both estimated fairly precisely.

21. The delta method requires the covariance between the public eligibility coefficient and the private eligibility coefficient, which can be obtained by estimating the private and public coverage equations jointly.

With panel data, Ham and Shore-Sheppard (2005b) are able to estimate simple dynamic models of coverage. They find that the longer a child has been eligible for Medicaid, the more likely she is to be enrolled in Medicaid and that the immediate impact of eligibility on take-up (estimated using an endogenous lagged dependent variable as an explanatory variable) is smaller than in the static models while the long-run impact from the dynamic model is larger than in the static models. The dynamic models, like the static models, show a statistically insignificant relationship between eligibility and private coverage. Ham, Li, and Shore-Sheppard (2009) consider dynamics within the context of a two-state duration model. Specifically, they use a linear probability model and data on children using the SIPP 1986–1996 panels to estimate the factors determining entry into and exit from public insurance. Each of the two transition rates depend on demographics, economic conditions, the introduction of TANF, and Medicaid income limits. They find that higher eligibility limits for public insurance increase the transitions into, and out of, public coverage. While the latter effect seems counterintuitive, they attribute it to higher-income families, who are likely to have a greater preference for private insurance and greater opportunities for jobs with private insurance, becoming eligible and obtaining coverage when they hit hard times, but then leaving public insurance when the economy recovers.

As discussed in section 1.2, the Medicaid expansions of the late 1980s and early 1990s were the result of several legislative changes. In terms of their effect on eligibility levels, the two most important changes in Medicaid rules came from the 1989 and 1990 Omnibus Budget Reconciliation Acts, which extended Medicaid eligibility to certain children in families with incomes below 133 percent and 100 percent of the federal poverty level. A distinctive feature of these laws is that eligibility was also tied to a child's age or birthdate. The 133 percent expansion applied to all children who were under age six, while the 100 percent expansion applied to children born after September 30, 1983. These rules created stark differences in coverage options for children on either side of these age-related eligibility boundaries. Card and Shore-Sheppard (2004) use regression discontinuity models applied to data from the SIPP and the National Health Interview Survey (NHIS) to exploit this quasi-experimental variation. For the 100 percent expansion they estimate a statistically significant Medicaid take-up rate of roughly 7 to 11 percent and a statistically insignificant effect of eligibility on other coverage. For the 133 percent expansion their parameter estimates are insignificant for both outcomes.

Overall, the results from the research on Medicaid expansions prior to the implementation of CHIP indicate marginal take-up rates that are fairly modest, typically ranging between 15 and 24 percent, although lower in some cases. While there is less of a consensus on the magnitude of crowd-out, even the largest estimates of the marginal loss of private coverage with eligibility are generally below 10 percent. Measuring crowd-out as the esti-

mates of private coverage loss rescaled by the Medicaid take-up rate may suggest that private coverage loss is more of a policy concern, although these estimates are driven as much by low levels of take-up (the denominator) as by reductions in private coverage (the numerator). Therefore, large estimates of crowd-out may not necessarily imply that a large number of people are substituting public coverage for private coverage—which is how such estimates are often interpreted—rather, they may be a symptom of low take-up of public insurance. The appropriate policy responses to a low take-up rate and a large effect of eligibility on private insurance coverage are likely to be different.

Researchers also used similar approaches to examine the effect of the CHIP eligibility expansions, which states implemented in different years between 1997 and 2000. Using CPS data, Lo Sasso and Buchmueller (2004) estimate a marginal take-up rate of 8 percent, lower than Cutler and Gruber's (1996) estimated Medicaid take-up rate, but similar to what Card and Shore-Sheppard (2004) find for the expansion of Medicaid eligibility to 100 percent of the FPL. Gruber and Simon (2008) obtain a similar estimate of the marginal take-up rate when they estimate simulated eligibility IV models using SIPP data. They provide two ratio crowd-out measures and use the common bootstrap to obtain confidence intervals for these measures. Their estimated 90 percent confidence intervals for the two measures are [0.097, 0.65] and [−0.11, 0.56], respectively, although these are likely to be lower bounds on the true confidence intervals. Hudson, Selden, and Banthin (2005), using data from the Medical Expenditure Panel Survey (MEPS), produce take-up and crowd-out estimates that are closer to those of Cutler and Gruber. Their results imply quite wide 95 percent confidence intervals for ratio crowd-out, and again these intervals are downward biased.

Lo Sasso and Buchmueller (2004) find a small and statistically insignificant effect of public insurance eligibility on private insurance. However, they also find evidence suggesting that private insurance is mismeasured. Using private nongroup insurance as the dependent variable, they find that eligibility for CHIP has a positive and significant effect on coverage. Since during this period many states either contracted with private managed-care plans to provide Medicaid benefits or designed their stand-alone CHIP plans to resemble private insurance, it is possible that some parents whose children had Medicaid or CHIP coverage said that this coverage was private when responding to the survey.[22] Gruber and Simon (2008) also find a small and

22. Card, Hildreth, and Shore-Sheppard (2004) examine a different issue of mismeasurement—the accuracy of reported Medicaid coverage in the SIPP. Using administrative records from California they find that the probability of correctly reporting coverage for those actually covered by Medicaid is around 85 percent, with this probability rising for low-income children. The probability that people who are not covered by Medicaid incorrectly report that they are covered is about 1.3 percent for the population as a whole, but is higher (up to 7 percent) for low-income children.

statistically insignificant effect of public insurance eligibility on private coverage. One innovation of Gruber and Simon's study is that they account for the fact that a nontrivial share of children is reported to have public and private insurance at a point in time. They find that eligibility has a positive effect on having both types of coverage.

Bronchetti (2014) estimates take-up and crowd-out effects for an even later period, 1998–2009, focusing on the different responses to changes in eligibility over this period for children in immigrant families and children of natives. Following welfare reform in 1996, which severely restricted access to public insurance eligibility among children of immigrants, in the ensuing years the implementation of CHIP, and in many states restoration of immigrant eligibility, led to an expansion of eligibility. Using the simulated IV approach and restricted-access data from the National Health Interview Survey, she runs separate take-up and crowd-out models for the two groups. She estimates the take-up response to eligibility among all children in immigrant families at a (very significant) 19.2 percentage points and among children in immigrant families with income below four times the federal poverty guidelines at an also highly significant 22.6 percentage points. For children of natives, the corresponding take-up rates are much smaller, 7.4 percentage points and 9.6 percentage points, respectively, although still quite easily distinguishable from 0. The effects of Medicaid eligibility on private insurance are estimated to be –2.8 and –5.1 percentage points (neither significant) for all children in immigrant families and those from families with income less than four times the poverty line. Among all children of natives the corresponding estimate is –3.1 percentage points (significant), while it is a statistically insignificant –2.2 percentage points for children of natives with family incomes below 400 percent of the FPL.

A recent addition to the literature on take-up and crowd-out presents an alternative to the linear probability IV models that these and many other studies use. Ham, Ozbeklik, and Shore-Sheppard (2014) develop a simple theory that suggests that one should estimate a Medicaid take-up probit equation using only data on those eligible for Medicaid, and separate probit equations for private insurance coverage for those eligible and those not eligible for Medicaid. Unlike the standard LPM approach, in this set-up the effect of Medicaid eligibility on insurance coverage will depend on a family's characteristics. Additionally, because the coefficients are constant and are not LATEs, the model can be used to make out-of-sample forecasts of the effect of raising the Medicaid income limits beyond their current levels, as well as estimating a measure of crowd-out among all of the currently eligible. This greater usefulness comes at a cost: if one wants to treat eligibility as endogenous, the computational burden of estimating the model directly becomes quite high. However, they show that there is an efficient and relatively easy to use indirect approach for estimating the model.

The authors implement the model using data on children from the 1986–

1993 SIPP panels. Their estimated effects of eligibility on coverage are precisely estimated and vary widely across the sample. The estimates show a clear pattern: eligible children from traditionally disadvantaged groups take up Medicaid at a higher rate and private insurance at a lower rate than do eligible children from typically less disadvantaged groups. Their estimates of the crowd-out effect of eligibility for the entire sample and for the different demographic groups have relatively small confidence intervals. The vast majority of crowd-out rates for the different demographic groups are statistically distinguishable from zero and negative, indicating that private and public insurance are indeed substitutes, although the degree of substitution is quite small.

This conclusion can be taken as a summary of the findings from the extensive literature on take-up and crowd-out responses to Medicaid eligibility for children: take-up responses have been small to moderate, and while some crowd-out appears to have occurred, its magnitude has been quite small and in many cases difficult to detect in the data. While there is a large range of take-up and crowd-out rates in the literature, it is important to note that different studies measure different effects. Perhaps this is not surprising given that most estimates are local average treatment effects that apply to different (but unobserved) marginal families. Even given this variability, one general result that does emerge from the literature is that marginal take-up rates are lower for families with higher incomes. The heterogeneity in response to eligibility by income and demographic group is an interesting avenue for future work. In addition, it is important for researchers interested in estimating crowd-out as the ratio of private to public eligibility coefficients to obtain consistent confidence intervals for their ratio crowd-out measures, such as by using the delta method. Given the substantial size of the confidence intervals that have been estimated and the fact that they are likely underestimates, researchers may want to reconsider the value of estimating ratio crowd-out without having very precise measures of take-up and level crowd-out to put into the ratio.

Estimates for Adults

A smaller number of studies examine the effects of changes in eligibility rules for adults. Busch and Duchovny (2005) use a standard simulated eligibility model to study expansions enacted in the wake of the 1996 welfare reform legislation, which allowed states to expand Medicaid eligibility for adults, and a policy enacted in 2000 allowing states to use unspent CHIP funds to insure low-income adults, mainly parents. They find that program eligibility raises a parent's Medicaid coverage by about 15 percentage points and reduces the probability of being uninsured by about 11 points. The estimated effect of eligibility on private coverage is small and statistically insignificant.

Hamersma and Kim (2013) also examine parental Medicaid expansions,

taking a different approach to modeling the effect of eligibility on coverage. They point out that eligibility is difficult to impute accurately since the information available in the data is not all of the information used by those who make the actual eligibility determination, and they find that about 40 percent of Medicaid recipients in their sample were not assigned to be eligible by their imputation procedure. Thus they take a reduced-form approach and use as their key independent variable the state's income eligibility threshold, rather than a measure of imputed eligibility. In models where coverage is estimated as a quadratic function of the eligibility threshold they find that raising the threshold increased Medicaid coverage, but at a decreasing rate. Their results imply that an expansion in eligibility threshold by an "average" amount (about 12 percent of the federal poverty level) increases Medicaid participation by about 4 percent of baseline coverage rates. The estimated relationship between the Medicaid eligibility threshold and private coverage is not statistically significant and often has the "wrong" sign. For comparability to other studies they estimate the simulated eligibility instrument approach as well, finding estimates of marginal take-up rates that are comparable to those found for children (on the order of 15 percent) and still no evidence of crowd-out. Overall, the evidence on Medicaid expansions to parents suggests similarly sized take-up effects to those estimated for children, and no significant effect on private coverage. Since the expansions to parents tended to be focused on fairly low-income families, these results are consistent with the results from studies of the early expansions to children.

Garthwaite, Gross, and Notowidigdo (2014) study a 2005 cutback in public insurance eligibility for adults in Tennessee. The state's program, TennCare, was unique among Medicaid programs in that it offered coverage to adults, including those without children, with incomes well above the poverty line if they were uninsured or "uninsurable." In response to budget shortfalls, Tennessee tightened its eligibility rules and disenrolled approximately 170,000 adults. Garthwaite, Gross, and Notowidigdo's analysis uses data from the CPS and a difference-in-differences model that compares adults in Tennessee to adults in other southern states. They also estimate a triple-difference model that contrasts outcomes for childless adults, who were the target of the disenrollment policy, and parents, who should have been less affected. Not surprisingly, they find that public coverage fell in Tennessee relative to the comparison states. Their baseline model indicates a coverage decline of 4.6 percentage points for all adults; the triple-difference model implies a 7.3 percentage point decline for childless adults (both statistically significant). Turning to private insurance, their difference-in-differences model implies that the elimination of TennCare eligibility led to a statistically insignificant 1.7 percentage point increase in coverage, while their triple-difference specification implies a marginally significant gain of 4.3 points (p-value = .09). They estimate the ratio crowd-out measure, using a modified block-bootstrap procedure to calculate the standard errors, obtaining an estimate

for the difference-in-differences model of 36.2 percent (standard error: 26.8) and for the triple difference model 59.5 percent (standard error: 38.4). Thus the resulting confidence intervals are very wide: [–16.3 percent, 88.7 percent] and [–15.7 percent, 134.8 percent], calling into question the usefulness of the ratio crowd-out measure even when correct confidence intervals are calculated.

In contrast, in the Oregon Medicaid experiment there was essentially no crowd-out. Finkelstein et al. (2012) estimate the insurance response to the Oregon lottery as the first stage in their examination of the impact of insurance on health. Their estimate is that the lottery increased Medicaid coverage by approximately 20 percent and did not reduce private coverage. Since the lottery removes the problems of endogeneity and mismeasurement from eligibility, their results have considerable credibility. At the same time, the fact that the experiment occurred during the Great Recession may limit the applicability of its results to other contexts.

Compared to children, impacts of eligibility for adults have been much less extensively researched, largely due to the fact that only recent policy changes have allowed for the identification of Medicaid effects separate from those of cash welfare or other programs. Making parents of Medicaid-eligible children eligible for Medicaid themselves appears to have clear positive impacts on coverage, with significant effects on take-up and little evidence of crowd-out. The evidence for nonparents is more equivocal, with the results from the studies that exist indicating the importance of the circumstances surrounding the conferral or removal of public coverage eligibility in determining the impact on take-up and crowd-out.

The introduction of the ACA presents opportunities to test existing estimates and models and to expand our knowledge of take-up and crowd-out behavior, since it represents a large expansion in eligibility, particularly for adults. One challenge here is that the ACA also contains a mandate to purchase insurance (or face a substantial fine), and researchers will have to adjust economic models and estimation procedures to incorporate this new provision. Under the ACA it will be important to estimate more realistic dynamic models, since the limited research in this area suggests that dynamics matter, and movement between Medicaid and other types of insurance may change as a result of the changing context for obtaining insurance.

The Impact of Other Policies Affecting Enrollment for Families

Along with changes in eligibility policy, states have implemented many other policies that have implications for take-up of the program. Some of these policies are intended to affect take-up, such as administrative reforms to make enrollment easier (presumptive eligibility, offering continuous coverage, or simplifying the application and renewal processes, for example) or outreach to encourage take-up. Other policies are intended to achieve other goals for the Medicaid program and have spillover effects on enrollment,

such as the introduction of premiums, the implementation of eligibility for parents at higher income levels, or changes in physician fees. Still other policies that are not directly related to Medicaid, such as immigration enforcement, may affect Medicaid take-up.

One concern about public health insurance expansions is that eligible individuals may be unaware that they are eligible. Consequently, some states implemented information provision or outreach campaigns. An important paper on the effectiveness of outreach is by Aizer (2007) who uses data on Medicaid enrollment outreach efforts in California to address two questions: (a) how successful are various types of outreach efforts at encouraging new enrollment? and (b) what impact does this new enrollment have on ambulatory-care-sensitive hospital admissions? (The second question is discussed below in the section on utilization of care.) Outreach includes community-based application assistants (organizations trained in enrolling eligible individuals [CBOs]) and a state advertising campaign. Aizer obtained data on CBO placement and administrative data on new Medicaid enrollment by ZIP Code, race, and month for February 1996 to December 2000 among all children ages birth to fifteen. Collapsing the data to ZIP Code-year-month-race cells, she examines the impact on enrollment of the number of CBOs in a ZIP Code controlling for ZIP Code fixed effects to account for the fact that areas with more intense outreach efforts may have higher numbers of low-income children, and time fixed effects to control for general trends in enrollment over this time period, respectively. She finds significant effects of CBOs, especially for Hispanic and Asian children. The estimates suggest that an additional Spanish-language CBO increases total new monthly Medicaid enrollment for Hispanic children by 9 percent, while an additional Asian-language CBO increases enrollment by 27 percent among Asian children. The effects are larger when the CBO is also a health-care provider. She also looks at advertising, including Spanish- and English-language TV ads, using a similar approach and finds that any effect of advertising is likely small. Thus it appears that information provision is important for enrollment, but informational interventions that are targeted and accompany the ability to provide services are more effective than a general information campaign.

In addition to outreach, as eligibility limits were raised the federal government began allowing states to implement a variety of policies intended to increase enrollment among the eligible. These policies included allowing applicants to apply in different places and with simpler processes. Currie and Grogger (2002) examine whether such policies were correlated with Medicaid caseloads at the state level for the period 1990–1996 and find no statistically significant relationship. However, when they examine vital statistics data on births they find some evidence that shorter forms or being allowed to mail in forms instead of having to apply in person is associated with earlier initiation of prenatal care. Outstationing of eligibility workers is

associated with inadequate prenatal care, however, suggesting that there may be omitted variables correlated with which states choose a particular policy.

A potential concern about increasing take-up for policymakers is that it may come at the cost of private coverage crowd-out, so under the CHIP program states were encouraged or required to implement policies to reduce crowd-out, such as mandatory waiting periods for previously insured children. In their analysis of the CHIP eligibility expansions, Lo Sasso and Buchmueller (2004) test for the effect of waiting periods on insurance coverage. They find that longer waiting periods decrease the probability that a child has public coverage, increase the probability of private coverage, and increase the probability of being uninsured. Thus, their results suggest that waiting periods are effective in reducing private coverage declines, though at the cost of limiting gains in the number of children with any health insurance. Wolfe and Scrivner (2005), who investigate state policy design features under CHIP using data from the 2000–2001 CPS, also find that waiting periods reduce public insurance take-up and increase the probability of being uninsured. In contrast, Gruber and Simon (2008) find no significant relationship between waiting periods and either public or private coverage. They suggest the difference may be due to differences between the data sets used in their study and that of Lo Sasso and Buchmueller (2004).

Wolfe and Scrivner (2005) find little effect for other program design variables, perhaps because there is relatively little variation in state policies over such a short time period. Bansak and Raphael (2006) compare insurance outcomes in 2001 to outcomes in 1997, just before CHIP implementation. To estimate the differential effect of state policy choices, they estimate regressions in which program design variables are interacted with an indicator variable that differentiates the pre-CHIP and post-CHIP periods. They estimate the models with state fixed effects to account for unobserved state characteristics that may be correlated with both baseline levels of insurance coverage and program features. They also find that waiting periods designed to prevent crowd-out reduce the probability a child has public insurance, and their results suggest that policies allowing for continuous enrollment increase public coverage.

Another policy that was at least partly intended to dissuade crowd-out, but was also a way to cover rising state spending on public health insurance, was the adoption of premiums for higher-income individuals. While Medicaid generally does not permit substantial amounts of cost sharing (unless a state has obtained a waiver to do so), states have more flexibility with CHIP, and during the early years of the twenty-first century several states adopted premiums. Several studies using data from selected states find a negative relationship between premiums and enrollment. Ku and Coughlin (1999/2000) find such an effect in Hawaii, Minnesota, Tennessee, and Washington. Kenney et al. (2006) examine state administrative enrollment records from 2001 to 2004–2005 from three states (Kansas, Kentucky, and

New Hampshire) and find that increases in premiums were associated with lower caseloads in all three states and with earlier disenrollment in Kentucky and New Hampshire. Similarly Marton (2007), who also studies Kentucky, finds that the introduction of premiums reduced enrollment duration, with larger effects in the first three months after the premium was introduced.

Dague (2014) uses a regression discontinuity design to study the introduction of premiums in Wisconsin's Medicaid program. Premiums in Wisconsin's program increase with income, with sharp breaks in the level of the premium at various income levels. While regression discontinuity designs with income can be problematic, as discussed above, in this case the administrative data that Dague uses permit her to observe the state's exact determination of family income, which is initially self-reported by applicants but is verified either through documentation such as paycheck stubs or direct employer verification. One issue with the administrative data that she faces is that she only observes outcomes for enrollees; however, she shows that in the case of studying the impact of premiums on enrollment spell length, selection would bias her against finding an effect. Interestingly, she finds large behavioral responses to the introduction of a relatively small premium, with a $10 premium requirement making enrollees 12–15 percentage points more likely to exit the program, but she finds very little evidence of responses to *changes* in premiums of a similar magnitude. This suggests that it is the premium *per se*, rather than its amount, which affects individual enrollment behavior.

There are two other policies that states may pursue that could have implications for enrollment in the program. First, the implementation of eligibility for parents at higher income levels than the AFDC level may encourage enrollment of children since the marginal benefit from completing the enrollment process would be higher if more individuals in the family could gain eligibility. The difficulty in examining the impact of parental eligibility expansions on children is in finding variation in parental enrollment that is uncorrelated with unobserved factors determining child enrollment. Sommers (2006) uses the March CPS matched across years, focusing on loss of coverage among children who appeared eligible in both years and modeling the probability of drop-out (loss of coverage while still eligible) as a function of parental and/or sibling coverage in year 1. He uses eligibility of the parent or sibling as an instrument for parent/sibling coverage. However, elsewhere in the literature researchers have recognized that eligibility may be endogenous, since unobserved factors that are more likely to make a parent eligible may also affect coverage. Sommers attempts to circumvent this issue by controlling for income, although the exogeneity of income is also questionable. He finds that if a parent is covered, the child is less likely to drop Medicaid, but there is no statistically significant effect of a sibling being covered.

Second, changes in physician fees may be associated with participation if,

for example, raising fees leads to greater physician participation, and individuals are more likely to enroll when they believe they can obtain needed care. Indeed, Hahn (2013) estimates models of the probability of various types of coverage as a function of the ratio of Medicaid to Medicare fees and controlling for state and year fixed effects and finds that a 10 percentage point increase in the ratio is associated with a 1.24 percentage point decrease in the uninsured rate among low-income children.

Taken together, the results of research on policies intended either to encourage take-up or to deter crowd-out can best be summarized as "circumstances matter." While there is evidence of effects from a variety of the policies studied, none of the policies studied show unequivocal effects across jurisdictions, time periods, or population groups. In addition, many of the results discussed may have limited applicability to Medicaid under the Affordable Care Act, with its underlying individual mandate for coverage. However, the fact that circumstances seem to be important when examining the effects of policies to encourage take-up suggests that examining the different enrollment regimes in different states under the ACA is an important area for future research.

Finally, it is possible that policies not particularly aimed at Medicaid may have spillover effects on Medicaid participation. Using newly obtained data on immigration enforcement activity (number of deportable aliens located per noncitizen) in the 1990s across the thirty-three Immigration and Naturalization Service administrative districts, Watson (2014) estimates the impact of enforcement activity on children of noncitizens. Controlling for a number of possible confounding effects with a rich set of fixed effects and demographic variables, she finds that a 1 log point increase in enforcement efforts (about the size of the increase in enforcement between 1994 and 2000) reduces Medicaid participation by children of noncitizens relative to children of citizens by 10.1 percentage points. Her results imply that much of the observed decline in participation in Medicaid by immigrants around the time of welfare reform can, in fact, be attributed to increased enforcement of immigration law. Similarly, Sommers (2010) shows that a later (2005) change requiring proof of citizenship at the time of Medicaid application was associated with a reduction in enrollment among noncitizens, although he points out that the costs of the policy (particularly the burden on citizen applicants) are significantly larger than the savings.

Eligibility, Take-Up, and Crowd-Out in Long-Term Care

Long-term care (LTC) expenditures account for a large and growing share of total health-care spending in the United States. As noted in section 1.2, a large share of Medicaid spending for aged and disabled adults is for institutional and non-institutional LTC services. Care provided in nursing homes is a main component of LTC expenditures. Medicaid is the largest purchaser of nursing home care, accounting for roughly three-fifths of national

expenditures (CMS 2014). In contrast, private health insurance accounts for only 8 percent of payments to freestanding nursing-care facilities. Why so few people purchase insurance for LTC, and the extent to which Medicaid reduces the demand for LTC insurance, are important research questions with significant policy implications.

In a series of papers, Brown and Finkelstein (2007, 2008, 2009, 2011) provide a comprehensive view of the market for LTC insurance and examine the puzzle of why so few Americans take up coverage. Brown and Finkelstein (2007) consider the potential importance of supply-side market failures as explanations by collecting the first data set on premiums for LTC. They then calculate expected costs of LTC for different groups, which allows them to ask if premiums for LTC policies are above the actuarially fair level. They find that premiums are 25–50 percent above the actuarially fair level for men, but appear close to actuarially fair for women. The existence of these excess profits for men suggests that the market has noncompetitive features. However, it is harder to explain why insurers discriminate against men in this fashion and even harder to explain why private insurance coverage rates are similar for men and women.[23] This difference in coverage between men and women only makes sense if there is an impediment on the demand side to women purchasing LTC insurance, assuming that price elasticities for the insurance are not very close to zero.

In another paper, Brown and Finkelstein (2008) investigate the demand side of the market using a calibrated life-cycle model of a consumer considering the purchase of private LTC insurance taking the supply side of the market as given. They consider the effect on consumer choice of two important aspects of how Medicaid is implemented. First, and most importantly, Medicaid is second-payer insurance and only pays what is not covered by private insurance. As a result, if consumers buy private insurance it primarily will cover expenses that Medicaid would have covered in the absence of the private insurance and thus imposes an implicit tax on private insurance expenditures; the higher the implicit tax, the less attractive private insurance is. They estimate for a man at the median of the income distribution, 60 percent of private benefits only replace expenses that Medicaid would have covered. For women, the implicit tax is even larger: almost 80 percent of private benefits go for services that Medicaid would have paid for in the absence of private coverage. (The higher implicit tax for women resolves the puzzle of why women do not buy more insurance given that they pay lower premiums relative to men than their life expectancies would merit.) Simple theory and simulations show that the demand for private insurance is decreasing in the implicit price.

Another important feature of Medicaid LTC insurance is that individu-

23. They note that some market imperfections may lead to quantity rationing in this market, but find no evidence of this in practice.

als/families must pass an asset test, that is, have assets under the relevant state maximum. Brown, Coe, and Finkelstein (2007) investigate the role of the asset test empirically using the restricted access version of the Health and Retirement Study (HRS) for 1996, 1998, and 2000. They examine the relationship between a family's purchase of LTC insurance and the amount of assets the family can protect under state law. They address the endogeneity of assets by regressing assets on demographic variables and state dummies and putting the predicted assets through the nonlinear formula determining protected assets to form an instrument. Thus, although they do not have an exclusion restriction they can legitimately exploit the nonlinearity of the protection formula.

Their preferred estimates suggest that a $10,000 decrease in the asset limits would decrease private LTC coverage by 1.1 percentage points. Their estimates imply that if every state moved from its current Medicaid asset eligibility requirements to the lowest (most stringent) Medicaid eligibility requirements allowed by federal law—a change that would decrease average household assets protected by Medicaid by about $25,000—demand for private LTC insurance would rise by 2.7 percentage points. While this represents a 30 percent increase in insurance coverage relative to the baseline ownership rate of 9.1 percent, it also indicates that 88 percent of households still would not hold private insurance. They also consider an even more draconian counterfactual where the lowest (most stringent) Medicaid eligibility requirements allowed by federal law are cut in half and every state moved from its current Medicaid asset eligibility requirements to the new federal limits, but this only results in a gain in private insurance coverage of 3.3 percentage points. The implication of their work is that while reducing asset limits reduces the crowding out of private insurance coverage, the gains in private coverage are quite limited.

Given that there is relatively little to be gained in terms of reducing the crowd-out of private insurance through the asset test, a natural question is how sensitive are consumers to the implicit price of private LTC insurance. In Brown and Finkelstein's (2008) simulations they find that lowering the implicit tax through a plan that allows employers to pay premiums for private LTC insurance (with this payment being nontaxable income from the employee's perspective) still leaves private insurance unattractive to the median male or female. They also note that the fact that marginal tax rates (and thus the tax subsidy) increase with wealth while the implicit tax decreases with wealth indicates the difficulty in using tax deductions to reduce the implicit tax for much of the population.

Two other studies examine policies aimed at using tax incentives to increase take-up of private LTC insurance. They both find that while the policies increased LTC coverage, the tax expenditures exceeded the savings to the Medicaid program. Courtemanche and He (2009) study the impact of a tax

incentive introduced by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Under HIPAA, LTC insurance premiums can be counted as medical expenses for the purpose of itemized deductions. Using data from the HRS and a difference-in-differences research strategy, they find that the HIPAA tax incentive increased take-up of private LTC insurance by 3.3 percentage points among those who itemize medical deductions. However, since itemizers comprise only about 14 percent of the individuals in their sample, the policy increased the private LTC coverage rate by less than half a percentage point for the population as a whole. They interpret their results as implying a price elasticity for LTC insurance of –3.9. Their simulations indicate that $1 of foregone tax revenue results in only a $0.39 reduction in Medicaid expenditure. When they extrapolate their results to measure the effect of LTC premiums being fully deductible (i.e., being an above-the-line deduction), they find that private coverage would rise from 10 percent to only 13.3 percent of the eligible population.

Goda (2011) examines tax subsidies introduced in the 1990s by a number of states with the goal of shifting LTC costs away from Medicaid. In her analysis, which also uses the HRS, the dependent variable is an indicator for purchasing private long-term care insurance and her main explanatory variable is the after-tax price of $1 of private LTC insurance in terms of foregone consumption. She treats the tax price as endogenous, using a simulated instrument in the spirit of Currie and Gruber's simulated eligibility variable. The variation in this instrument comes from changes in tax subsidies for LTC insurance across states and time. Her preferred estimates imply a price elasticity with respect to the after-tax price of –3.3. However, this response to the tax subsidy is concentrated among wealthier households who generally would not have qualified for Medicaid in the absence of the incentive policy. Simulations based on her model suggest that $1 in tax expenditures produces $0.84 in Medicaid savings.

Taken as a whole, this literature suggests that Medicaid substantially reduces the demand for private long-term-care insurance and there is not much scope for improving crowd-out while making marginal changes to Medicaid LTC. However, some findings point to alternative policy approaches. Specifically, Brown and Finkelstein (2008) find in their simulations that modifying Medicaid to allow for private LTC insurance that tops up, rather than replaces, Medicaid coverage dramatically increases welfare. However, Brown and Finkelstein note that such a reform could be quite expensive in terms of additional government expenditure. Further, they argue that reforming Medicaid to reduce or eliminate the implicit tax might have limited effects if there are important demand-side factors affecting private coverage take-up such as individual myopia or relying on one's children to provide support, or if market imperfections on the supply side of the market are sufficiently serious.

1.5.2 Access, Utilization, and Health

Children, Infants, and Pregnant Women

Because women and children have historically accounted for the majority of Medicaid enrollment, much of the research examining effects on medical-care utilization and health focuses on those populations. In addition, various features of Medicaid coverage for these populations have made obtaining plausibly causal inferences more feasible. In particular, studies in this literature exploit variation arising from the eligibility expansions of the 1980s and 1990s, including an important discontinuity in eligibility rules that occurred during this period. Table 1.7 lists both seminal and some of the more recent studies from this literature.

Currie and Gruber (1996a) estimate the effect of Medicaid eligibility on several measures of health-care utilization for children, using data from the National Health Interview Survey (NHIS) from the 1984–1992 period and the simulated eligibility measure they developed as an instrumental variable calculated using data from the Current Population Survey (CPS). One outcome is the probability of not having at least one physician visit over the past twelve months. Since it is recommended that all children have an annual "well child" visit, this outcome can be seen as a general measure of access to care. Their IV estimates imply that Medicaid eligibility reduces the probability of not having a visit by nearly 10 percentage points, or roughly half of the baseline rate. They use data on the location of care to investigate whether Medicaid eligibility reduces the use of hospital emergency departments and outpatient clinics in favor of care received in physicians' offices. They find that Medicaid eligibility has a fairly large, though imprecisely estimated, effect on the probability of receiving care in a doctor's office. The estimated effect on the probability of visiting a hospital emergency department or clinic is also positive, though again not statistically significant.

Card and Shore-Sheppard (2004) examine the effect of Medicaid eligibility on the probability of having at least one doctor visit in a year using a regression discontinuity design as discussed in the above section on take-up and crowd-out, and data from the NHIS. As with their results for take-up, they find the largest (and most statistically significant) effects for the expansion of eligibility to children below poverty, with estimates suggesting that children with newly available health insurance coverage have a 60 percent higher probability of at least one annual doctor visit, although the confidence interval on this estimate is fairly wide (the standard error is 31 percent). The estimate for children eligible only under the expansion to 133 percent of the FPL, while positive, has a substantial standard error. De la Mata (2012) also uses a RD design in income, though (as discussed earlier) the use of income as the assignment variable is somewhat problematic because of unobserved differences in the income-counting methodologies across states that lead to actual income-eligibility cutoffs differing from reported cutoffs.

Table 1.7 **Studies of access, utilization, and health**

Study	Data	Population	Design	Results
Currie, Gruber, and Fischer (1995)	Vital Statistics 1979–1992; March CPS	Infants and pregnant women	State-year panel with lagged dependent variable. Dependent variables: infant mortality, Medicaid expenditures. Main independent variables: ratio of Medicaid to private fees for ob/gyns, imputed Medicaid eligibility.	Raising the fee ratio by 10 percent lowers infant mortality by 0.5 to 0.9 pp. Eligibility expansions reduced infant mortality rate but increase Medicaid expenditures, particularly for hospitals.
Currie and Gruber (1996a)	NHIS; March CPS, 1985–1993; Vital Statistics	Children	IV using simulated eligibility instrument. Dependent variables: doctor visits, state-level infant mortality. Main independent variable: imputed eligibility.	Medicaid eligibility reduces prob. of a child going without a doctor's visit in past year by one-half, raises prob. of child seeing doctor within past two weeks by two-thirds, also reduction in state-level child mortality.
Currie and Gruber (1996b)	March CPS, 1979–1992; Vital Statistics; HCFA; NSLY	Pregnant women and infants	IV using simulated eligibility instrument. Dependent variables: incidence of low birth weight, infant mortality. Main independent variable: imputed eligibility.	Medicaid eligibility changes from 1979–1992 increased the percentage of women eligible for Medicaid in case of pregnancy by 30.9 pp. A 30 pp. increase in Medicaid eligibility of pregnant women leads to an 8.5 pp. decline in infant mortality. Targeted eligibility changes are more effective than broad eligibility changes.
Joyce (1999)	Linked Medicaid administrative data and New York State birth certificates, 1989–1991	Infants and pregnant women	Stratified cross-section and IV. Dependent variables: use of prenatal services, infant birth weight. Main independent variable: Prenatal Care Assistance Program (PCAP) participation.	Participation in PCAP is associated with a 0.2 increase in the probability of enrollment in WIC, a 35 g increase in mean birth weight, and 1.3 pp. decrease in rate of low birth weight.
Gray (2001)	National Maternal and Infant Health Survey 1988	Pregnant women	Cohort difference in difference. Dependent variables: low birth weight, premature birth, infant mortality. Main independent variables: Medicaid physician fees, Medicaid coverage.	An increase in Medicaid physician fees of 10 percent relative to the mean results in 0.074 pp. reduction in risk of low birth weight, 0.035 pp. reduction in risk of very low birth weight for Medicaid-insured women.

(*continued*)

Table 1.7 (continued)

Study	Data	Population	Design	Results
Currie and Grogger (2002)	Vital Statistics Detailed Natality Files, 1990–1996	Universe of pregnant women	Repeated cross section Dependent variables: utilization of prenatal care, low birth weight, and infant mortality. Main independent variables: Medicaid income cutoffs, administrative reforms, welfare caseload.	Higher Medicaid income eligibility cutoffs and higher welfare caseloads increase use of prenatal care and reduce fetal deaths. No consistent effect of administrative reforms.
Card and Shore-Sheppard (2004)	SIPP, 1990–1993; HIS, 1992–1996; March CPS, 1990–1996	Children	Regression discontinuity Dependent variable: At least one doctor visit in past year. Main independent variable: income below cutoff and age in eligible range.	Children newly covered have a 60 percent higher probability of at least one annual doctor visit than in the absence of the expansion (standard error 31 percent)
Aizer, Lleras-Muney, and Stabile (2005)	Linked birth and death certificates from CA, 1989–1995	Insured pregnant women	Differences in differences Dependent variable: neonatal mortality. Main independent variables: public/private insurance status, index of hospital segregation.	Increasing access to care has small impact on neonatal mortality for entire sample; for blacks, the average decline in segregation over the sample period results in a 7 percent reduction in neonatal mortality; for twins, 12.5 percent decline; for black twins, 42 percent.
Dafny and Gruber (2005)	National Hospital Discharge Survey, 1983–1996	Children	IV using simulated eligibility instrument. Dependent variable: child hospitalizations. Main independent variable: imputed Medicaid eligibility by age group, state, and year.	A 10 pp. rise in Medicaid eligibility is associated with an 8.1 pp. increase in the unavoidable hospitalization rate, and statistically insignificant 3.2 pp. in avoidable hospitalization rate.
Aizer (2007)	Medicaid enrollment and administrative data, 1996–2000. Data set of locations of community-based application assistant locations	Children	Zip Code-race-month-year panel and IV. Dependent variables: Medicaid enrollment, avoidable hospitalizations. Main independent variable: number of community-based application assistants in the ZIP Code.	Proximity to an additional bilingual application assistant increases new monthly Medicaid enrollment among Hispanics by 7 to 9 pp., and among Asians by 27 to 36 pp. Increasing the number of children with Medicaid by 10 pp. results in 2 to 3 pp. decline in avoidable hospitalizations.

Currie, Decker, and Lin (2008)	NHIS, 1986–2005	Older children	Repeated cross section Dependent variables: utilization of care, health status. Main independent variables: household income, public insurance eligibility.	The importance of income for predicting health for older children has fallen over time. Eligibility for public health insurance increases utilization of preventative care. No effect on current health status.
Finkelstein et al. (2012)	Survey; administrative data from hospital discharge records, credit reports, and mortality records 2008–2009	Adults	Experimental Dependent variables: self-reported health, financial strain, well-being, health-care utilization, health insurance status. Main independent variable: randomly assigned Medicaid applicant status.	Being selected by the lottery results in a 25 pp. increase in the prob. of having insurance after one year. Having insurance coverage is associated with a 2.1 pp. increase in prob. of hospital admission, a 20 pp. decline in having any out-of-pocket medical expenditure, and a .2 SD improvement in self-reported physical and mental health.
Kolstad and Kowalski (2012)	CPS, HCUP National Inpatient Sample 2004–2008, BRFSS	Hospital discharges in MA	Difference in difference Dependent variables: insurance status, length of hospitalization, hospital costs. Main independent variables: postexpansion indicator, MA indicator.	Healthcare reform in MA decreased uninsurance by 36 percent relative to initial level, reduced length of hospitalizations. No effect on hospital cost growth.
de la Mata (2012)	PSID 1997, 2002, 2007	Children	Regression discontinuity Dependent variables: health-care utilization, health status. Main independent variable: family income.	Medicaid eligibility increases the use of preventive health care by 11 to 14 pp., but only at low income thresholds. No significant effects on health outcomes in the short and medium run.
Miller (2012)	Acute Hospital Case Mix Databases, from the MA Division of Health Care Finance and Policy, 2002–2008	Counties in MA	Difference in difference Dependent variables: ED use per capita. Main independent variables: 2005 uninsurance rate, expansion indicator.	MA health-care reform reduced ED usage by 5 to 8 percent, with decline concentrated for event that can be treated in a physician's office. No effect on ED use for nonpreventable emergencies.
Sommers, Baicker, and Epstein (2012)	CDC Compressed Mortality File, 1997–2007; CPS 1997–2007; BRFSS 1997–2007	Adults	Difference in difference Dependent variables: all-cause county-level mortality, insurance coverage, incidence of delayed care due to cost, self-reported health status. Main independent variables: postexpansion indicator, expansion state indicator.	Medicaid expansions are associated with a significant 6.1 percent reduction in all-cause mortality, 3.2 pp. decrease in rate of uninsurance, 2.9 pp. decrease in rate of delay of care due to cost, and 2.2 pp. improvement in rate of self-reported health status very good or better.

(*continued*)

Table 1.7 (continued)

Study	Data	Population	Design	Results
Baicker et al. (2013)	Survey	Adults	Experimental Dependent variables: clinical outcomes (e.g., blood pressure), health status, health-care use, out-of-pocket medical spending. Main independent variable: randomly assigned Medicaid applicant status.	Medicaid coverage significantly increases the probability of diagnosis of diabetes, decreases the probability of positive screening for depression by 0. 915, increases use of preventative health services, nearly eliminates catastrophic out-of-pocket medical spending.
DeLeire et al. (2013)	Wisconsin's administrative Medicaid claims and enrollment databases	Childless uninsured adults	Case-crossover design Dependent variables: outpatient visits, ED visits, inpatient hospitalizations, preventable hospitalizations. Main independent variable: automatic enrollment status in "BadgerCare Plus Core Plan."	In twelve months following enrollment in public insurance program, outpatient visits increase 29 percent, ED visits increase 46 percent, inpatient hospitalizations fall by 59 percent, and preventable hospitalizations fall by 48 percent.
Bronchetti (2014)	Restricted-access National Health Interview Survey, 1998–2009	Children in immigrant families and children of natives (estimated separately)	IV using simulated eligibility instrument. Dependent variables: no doctor visit in a year, usual place for care, any hospitalization, ED visit, self-reported health status, school days missed, asthma attack. Main independent variable: imputed eligibility.	For children in immigrant families: being eligible reduces probability of no visit by 0.115 (0.047), of ED visit by 0.062 (0.030), of asthma attack by 0.020(0.011); being eligible increases probability of having a usual place of care by 0.077 (0.027) and of excellent health by 0.073. For children of natives: being eligible reduces probability of asthma attack by 0.025 (0.009) and increases probability of having a usual place of care by 0.021 (0.012).
Taubman et al. (2014)	Emergency department records from twelve Portland, OR hospitals, 2007–2009 survey	Adults	Experimental Dependent variable: Emergency department visits. Main independent variable: randomly assigned Medicaid applicant status.	Medicaid coverage significantly increases overall emergency department use by .41 visits per person, a 40 percent increase relative to average. No decline in emergency department use for any subgroups.

Boudreaux et al. (2015)	Panel Study of Income Dynamics	Young adults	Exposure to Medicaid estimated based on birth year and state of residence. Dependent variable: index of chronic health conditions	Exposure to Medicaid in early childhood is negatively associated with chronic health conditions as a young adult.
Goodman-Bacon (2015)	Vital Statistics, Multiple Cause of Death Data Files	Children	Difference-in-differences event study comparing states with larger and smaller changes in insurance coverage.	Mortality fell significantly more for nonwhite children in high rages of eligibility than in states with low rates of eligibility.
Wherry and Miller (2015)	National Health Interview Survey; Healthcare Cost and Utilization Project—National Inpatient Survey	Young adults	IV using simulated eligibility instruments for eligibility in utero and during childhood. Dependent variables: self-reported health, obesity, hospitalization.	Medicaid eligibility as a child is significantly associated with better self-reported health, lower rates of obesity, and lower hospitalization rates an adult.
Wherry, Miller, Kaestner, and Meyer (2015)	National Health Interview Survey; Healthcare Cost and Utilization Project—State Inpatient and Emergency Department databases	Young adults	Regression discontinuity	Medicaid eligibility associated with lower rates of hospitalization for blacks; no significant effect for whites
Wherry and Meyer (forthcoming)	Vital Statistics, Multiple Cause of Death Data Files	Children	Regression discontinuity	Medicaid eligibility associated with lower mortality for black children; no significant effect for whites

Using data on children ages five to eighteen from the Panel Study of Income Dynamics, she finds increases in the probability of at least one doctor visit of 12–14 percentage points, but only for children eligible under lower eligibility thresholds (100–185 percent of the FPL). She finds no statistically detectable effect on health, either for contemporaneous or lagged eligibility.[24]

In contrast, Bronchetti (2014) finds evidence not only of increases in health-care utilization resulting from eligibility for Medicaid and CHIP, but also some evidence of improvements in health, particularly for children in immigrant families. She estimates models of utilization and health as a function of eligibility (using a simulated eligibility instrument) on restricted-access data from the National Health Interview Survey for 1998–2009, a time period with significant expansions in eligibility for children in both immigrant and native families due to the introduction of CHIP and the relaxation of some rules preventing coverage of immigrants that had been enacted under welfare reform. Examining children in immigrant families and natives separately, she finds beneficial impacts of eligibility for both children in immigrant families and natives, but estimates for children in immigrant families show larger benefits, particularly for utilization. Specifically, for children in immigrant families she finds a 12-percentage-point reduction in the probability of no doctor visit, an 8-percentage-point increase in the probability of having a usual place for care, a 6-percentage-point reduction in the probability of an emergency department visit, and improvements in measures of self-reported health and asthma morbidity. The estimates for natives are generally smaller, and are only statistically significant for having a usual place for care and for asthma. She notes that the larger effects for children in immigrant families likely arise from the fact that such children were much less likely to have insurance coverage prior to the expansions, making this group akin to the group affected by the early Medicaid expansions of the 1980s.

Several studies examine the effect of Medicaid on inpatient utilization. As described in section 1.4, the effect on this outcome is theoretically ambiguous. On one hand, there is likely to be an access effect: by providing access to costly care that low-income patients could not otherwise afford, Medicaid should have a positive effect on inpatient utilization. At the same time, by improving timely access to primary and preventive care, Medicaid may lead to health improvements that reduce the number of "avoidable" hospitalizations for conditions like asthma, gastroenteritis, dehydration, and certain infections. An analysis by Currie and Gruber (1996a) suggests that the first of these two effects dominates: Medicaid eligibility increases the probability of having a hospital stay by about 4 percentage points, which represents

24. Other studies using different data and different research designs also find that utilization increased for children who gained eligibility for public insurance because of CHIP relative to children who did not gain eligibility (Selden and Hudson 2006; Lurie 2009; Li and Baughman 2010; Choi, Sommers, and McWilliams 2011).

nearly a doubling of the baseline rate. The NHIS data they use does not provide details on the nature of the inpatient care received, so they are not able to assess whether the Medicaid expansion reduced avoidable admissions.

Dafny and Gruber (2005) explore this issue in more detail by matching data on Medicaid eligibility measured for state/year/age group cells with data from the National Hospital Discharge Survey, adapting the simulated eligibility IV approach to these aggregate data. Their results for total hospitalizations are nearly identical to Currie and Gruber's (1996a): a 10-percentage-point increase in Medicaid eligibility increases the pediatric hospitalization rate by 8.4 percent. They then estimate separate regressions for hospitalizations classified as avoidable or unavoidable based on the prior health services literature in this area. According to their definition, roughly one-quarter of pediatric hospitalizations during the period they study were classified as avoidable. When the dependent variable is the natural log of unavoidable hospitalizations, the coefficient on the Medicaid eligibility variable is positive and significant, with a magnitude that is similar to the estimate for all hospitalizations. For avoidable hospitalizations, the coefficient on the Medicaid eligibility rate is still positive, but smaller and not significantly different from zero.

Aizer (2007) also uses IV methods to estimate the effect of Medicaid on avoidable hospitalizations, though she estimates the effect of Medicaid *enrollment* on children who were already eligible rather than the effect of eligibility. She finds that a 10 percent increase in Medicaid enrollment leads to a 2 to 3 percent decline in avoidable hospitalizations, but has no effect on hospital admissions for other conditions. These effects are large enough that the savings from reduced admissions were likely greater than the cost of the outreach program. The difference between her results and those of Dafny and Gruber may be explained by the fact that the children who gain insurance coverage because of a change in eligibility experience improved access to both outpatient and inpatient care. In contrast, since children who enrolled because of the outreach efforts already had "conditional coverage" for inpatient care in the sense that they could sign up for Medicaid if they presented at a hospital in need of acute care, the main effect of gaining coverage was improved access to primary and preventive care.

The analyses conducted by Aizer (2007) and Dafny and Gruber (2005) test for immediate effects of Medicaid coverage on proxies for child health. However, since health is a stock, it should be affected by past investments as well as current ones. Thus, to the extent that an important benefit of Medicaid is improved access to primary and preventive care, it may take time for effects on health to be realized. This is how Currie, Decker, and Lin (2008) interpret the findings of their analysis of older children using multiple years of data from the National Health Interview Survey. Using the simulated eligibility instrument approach, they find that eligibility for Medicaid significantly reduces the probability that a child does not have at least one

physician visit in a year, but has no significant effect on contemporaneous health status. However, their results suggest that children who were eligible for Medicaid when they were toddlers are more likely to be in excellent health (as reported by their parents) between the ages of nine and seventeen.

Several recent working papers find evidence that having access to Medicaid as a young child leads to better health later in life. In an analysis using the Panel Study of Income Dynamics, Boudreaux, Golberstein, and McAlpine (2014) use variation across states in the timing of the introduction of the program in the 1960s to identify long-term effects among cohorts with different exposure to the program in early childhood. Miller and Wherry (2015) analyze the effect of a later coverage expansion and obtain similar results. Using a simulated eligibility instrumental variables model they find that individuals whose mothers gained eligibility as a result of the expansions for pregnant women in the late 1980s and early 1990s experienced better health outcomes as young adults. They also find a negative effect on hospitalizations for conditions that have been previously shown to be sensitive to the in utero environment, such as diabetes.

Wherry et al. (2015) exploit the same discontinuity as Card and Shore-Sheppard (2004) to investigate the effect of Medicaid eligibility as a young child on health status as a teenager and young adult. They show that poor children who were born just before September 30, 1983—the cutoff specified by OBRA 1990—enjoyed up to nearly five more years of eligibility than otherwise similar children who were born just after that date. These additional years of potential Medicaid eligibility are associated with fewer hospitalizations and emergency department visits as a young adult. Stratifying the analysis by race, they find statistically significant effects for blacks but not whites. This pattern is consistent with their finding that blacks were more likely to gain eligibility as a result of the OBRA 1990 expansions.

Several studies test for an effect of Medicaid eligibility on mortality, applying different identification strategies to data from different periods in the program's history. Focusing on the eligibility expansions of the 1980s and early 1990s, Currie and Gruber (1996a) regress the death rate by state-year-age-race cell on the imputed fraction eligible in that cell from the CPS, and using simulated eligibility for a national sample by state, year, and age as instruments, they find a reduction of 0.13 percentage points in mortality for every 10 percentage point increase in Medicaid eligibility. In their other paper focusing on the same eligibility expansions, Currie and Gruber (1996b) use vital statistics data for the period 1979–1992, to explore the impact of Medicaid eligibility changes on the fraction of births that are low birth weight and the infant mortality rate by state and year. One difference with their analysis of child mortality is that in this paper they distinguish between the earliest expansions that were aimed at women well below the poverty line and that sometimes included income increases through AFDC as well as expanded access to health insurance coverage (what they call "tar-

geted" expansions) and later expansions aimed at women with incomes as high as the poverty line or slightly higher (what they call "broad" expansions). They find evidence both for a reduction in low birth weight incidence and a reduction in infant mortality. However, these reductions appear only to come from the earlier "targeted" expansions that might also have involved cash assistance changes; later insurance-only expansions higher up the income distribution show no statistically significant effect.

Wherry and Meyer (forthcoming) apply RD methods to the discontinuity created by the OBRA 1990 eligibility rules to examine the cumulative effect of Medicaid eligibility on child mortality several years after the OBRA 1990 expansion went into effect. In the years just after the expansion, when children born in 1983 were between the ages of eight and fourteen, there is some evidence suggesting a reduction in mortality for black children, though the estimates are imprecise and sensitive to the specification. However, between the ages of fifteen and eighteen, the mortality differences between black children born just before and just after September 30, 1983, are large and statistically significant. For this group, the results imply a 13 to 20 percent decrease in mortality from internal causes. In contrast, Wherry and Meyer find no evidence of a mortality effect for white teenagers. These racial differences resemble the pattern that Wherry et al. (2015) find using essentially the same research design to study health status. As noted in the discussion of that paper, black children were substantially more likely than white children to gain Medicaid eligibility as a result of the OBRA 1990 expansion.

A recent study by Goodman-Bacon (2015) takes yet another approach to investigate the relationship between Medicaid and child mortality. He applies a difference-in-differences event study model to state-level mortality data for the years 1959 to 1979. The key source of variation in his analysis comes from the fact that Medicaid eligibility was initially tied to the receipt of cash welfare benefits, resulting in larger coverage gains in states with higher AFDC participation rates. Prior to the introduction of Medicaid, there was no significant difference in mortality trends between "high-eligibility" and "low-eligibility" states. After the program was established, mortality fell significantly more for nonwhite infants and young children in high-eligibility states than for those in low-eligibility states. Goodman-Bacon finds no significant mortality effects for white infants or older children. Similar to the case of the OBRA 1990 expansion, a possible explanation for the way the results differ with race is that when Medicaid was implemented nonwhite children were more likely to gain coverage because they were more likely to have previously been receiving AFDC.

Like Currie and Gruber (1996a) and Wherry and Meyer (forthcoming), Goodman-Bacon finds that the overall mortality effects were driven by large declines in internal-cause mortality, especially mortality caused by infectious diseases, which during this period were typically treated with antibiotics and other drugs. One important difference between Goodman-Bacon's

results and the other mortality studies has to do with the magnitudes of the estimated effects. To compare magnitudes he calculates Average Treatment Effects on the Treated (ATETs) for his analysis and those of Currie and Gruber (1996a) and Wherry and Meyer (forthcoming). The ATETs based on his difference-in-differences results imply a 24 percent mortality reduction for nonwhite children under age fourteen and a 38 percent reduction for nonwhite children between the ages of one and four. While these are large effects, they are substantially smaller than the ATETs for the other studies, which in some cases exceed 100 percent. He suggests the explanation may be that estimates based on the eligibility expansions of the 1980s may reflect additional causal mechanisms besides Medicaid.

Overall, the results from the literature thus far point to expansions in eligibility for Medicaid leading to improvements in access to care and health, although the magnitudes of the effects are sometimes difficult to pinpoint and estimates often differ for different groups or at different times. Although effects on access and utilization tend to be evident immediately, effects on health status appear to take some time to develop. Looking at the literature as a whole, it also appears that Medicaid expansions affecting more disadvantaged children tend to show more consistent positive effects. While the pattern of greater effects for lower-income children makes sense given the greater availability of alternative health insurance sources for higher-income children, the pattern is worth further exploration; in particular, it would be worthwhile to investigate whether these results are related to the way that cash assistance was a part of some expansions, but not others. This is particularly important for those researchers interested in exploring long-term effects of the health improvements discussed here.

In addition, the role of policy endogeneity in state choices is an issue that has received limited attention but is worth exploring given the frequent use of state-level variation to identify models. To the extent that state choices about how far to expand their programs reflect conditions faced by individuals in the state, estimated effects of Medicaid eligibility may also reflect state responses to these conditions. Continued examination of the impact of Medicaid and CHIP expansions on short-run and long-run health outcomes is valuable to assess more fully the impact of these programs.

Researchers have also examined the impacts of other Medicaid policy shifts, particularly payment policy, on health. Aizer, Lleras-Muney, and Stabile (2005) examine the infant mortality effects of an increase in Medicaid payments to hospitals in California through the DSH program. Pregnant women with Medicaid insurance may obtain care from different providers if providers are unwilling to treat Medicaid patients due to low reimbursement rates. Using infant-linked birth and death certificate data, Aizer, Lleras-Muney, and Stabile find that the DSH program hospital payment increase led to a substantial move by pregnant women with Medicaid insurance to hospitals with prior low use by the Medicaid population. The deseg-

regation of hospitals by insurance type was associated with an improvement in neonatal mortality, particularly among those with the highest levels of neonatal mortality: black infants and twins. The larger effects for black infants were particularly noteworthy since black mothers were the least likely to increase their use of private hospitals, indicating the continuing existence of some barriers (informational or otherwise) to use of higher-quality care by black Medicaid recipients.

Another set of papers has examined the impact of physician fees on health outcomes. These papers use variation in fees paid to physicians either across states relative to private fees (Gray 2001), across states and time relative to private fees (Currie, Gruber, and Fischer 1995), or in the availability of enhanced prenatal care services relative to regular prenatal care services associated with the Medicaid eligibility expansion in New York (Joyce 1999). All of these papers find that higher fees are associated with improved health outcomes.

Nondisabled Adults

There has been much less research on the utilization and health effects of Medicaid for adults, even though very poor single parents have had access to Medicaid coverage since its inception, and parental Medicaid has expanded considerably in recent years. However, recent expansions to non-parents under various waivers have led to a rise in research on this population.[25] This research is of particular interest since the Medicaid expansion of the ACA will mainly affect adults, particularly childless adults, and thus these studies on programs in individual states provide valuable evidence on the likely effect of public insurance on the health-care utilization and health of this population.

The best evidence on the effect of Medicaid on health-care utilization and health for adults comes from the Oregon Health Insurance Experiment (OHIE). In three different papers (Finkelstein et al. 2012; Baicker et al. 2013; Taubman et al. 2014) the OHIE researchers estimate utilization effects using both survey and administrative data. Results from the survey data indicate sizable effects on outpatient visits and prescription drug use. Gaining Medicaid coverage through the lottery increased the probability of having an outpatient visit by 35 percent and increased the probability of filling a prescription by 15 percent. The increased visits coincided with greater receipt of recommended preventive services. Medicaid coverage led to a 20 percent increase in the likelihood of having a cholesterol test, a 15 percent increase in blood tests for diabetes, a 60 percent increase in mammograms and a 45 percent increase in the percentage of women getting a

25. Interestingly, despite the large fraction of expenditures devoted to the elderly and disabled populations, there is a dearth of research on the health and utilization effects of Medicaid for this population.

Pap test. However, although testing clearly increased, the researchers 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. For diabetes, on the other hand, having Medicaid coverage significantly increased the probability of a diagnosis and the use of diabetes medication, but there was no significant effect on measures of diabetes control (Baicker et al. 2013).

There was no significant change in inpatient utilization in the survey data, though hospital discharge data indicate that Medicaid coverage increased the probability of an admission by 2.1 percentage points, a 30 percent effect relative to the mean for the control group. This effect was driven by an increase in admissions that did not originate in the emergency room. There was also a small positive effect on the intensity of inpatient treatment as measured by a composite outcome that combines the number of inpatient days, the number of procedures, and total charges.

The initial analysis of survey data indicated no significant effect of Medicaid coverage on emergency department utilization with wide confidence intervals (Finkelstein et al. 2012). However, follow-up analysis using administrative data from twelve Portland area hospitals found that Medicaid coverage increased outpatient emergency department visits by 40 percent over an eighteen-month period. There was no statistically significant increase in emergency department visits leading to an inpatient admission.[26] Additional analyses indicate that the effect of Medicaid on emergency visits was fairly consistent across different times of day and different types of care. Medicaid led to a significant increase in visits for conditions not requiring immediate care and most types of conditions where immediate care is required.

Examining general measures of health in addition to the clinical outcomes discussed above, the treatment group reported significantly better outcomes for seven different measures of self-reported physical and mental health from a survey of lottery participants, including a significant decrease in the probability of depression (Finkelstein et al. 2012). Since Medicaid enrollees' credit reports indicated significantly lower probability of having any debt in collection and particularly any medical debt in collection, and they reported significantly lower signs of financial strain in the survey, it is possible that self-reported physical and mental health may largely reflect a generally improved sense of well-being rather than physical health improve-

26. Other studies using different research designs also find a positive correlation between Medicaid coverage and emergency department utilization. For example, Shen and Zuckerman (2005) find that, controlling for observable characteristics, individuals with Medicaid coverage are twice as likely to have an emergency department visit than someone who is uninsured. Anderson, Dobkin, and Gross (2012) use a regression discontinuity approach that exploits the fact that many young adults lose private health insurance, and to a lesser extent Medicaid, when they turn nineteen. They find that there is also a significant decrease in emergency visits and inpatient admissions at that age.

ments per se (the financial results are discussed further below). Nevertheless, to the extent that health is measured by the definition of the World Health Organization ("a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity") it is clear that coverage by Medicaid improved enrollees' health.

In addition to the Oregon experiment, there are other recent state programs that provide insight on how the ACA Medicaid expansions will affect the health-care utilization of poor adults who will gain coverage. DeLeire et al. (2013) evaluate the utilization effects of a Wisconsin program, BadgerCare Plus Core, which closely resembles Medicaid. The program enrolled poor adults in Milwaukee County who tended to have high rates of chronic illness and who had previously received care at facilities reimbursed by Medicaid Disproportionate Share funds. DeLeire and colleagues find that enrollment in the new plan led to an increase in all types of outpatient utilization, including emergency department visits. In another study evaluating the utilization effect of the same program but on a rural low-income (FPL < 200 percent) population, Burns et al. (2014) found a similar effect on outpatient visits, but inconclusive results on emergency department use. One interesting contrast with the Oregon results is that when BadgerCare Plus Core was implemented in Milwaukee, inpatient utilization fell for individuals who transitioned to the new program. In particular, there was a large and significant decline in admissions for ambulatory-care-sensitive conditions. One possible explanation is that because these patients previously faced restricted access to outpatient specialty care, emergency department physicians may have admitted them in order to ensure they received diagnostic tests. With better access to specialists in outpatient settings, these admissions fell.

There have been several studies of Massachusetts' 2006 health care reform, which like the ACA increased both Medicaid and private insurance. The results from these studies paint a more optimistic picture concerning the potential for coverage expansions not only to improve access to care, but also to shift the source of care from hospitals to lower-cost settings. Miller (2012) examines the change in emergency department visits after the Massachusetts coverage expansion using prereform variation in insurance-coverage rates to identify causal effects. She finds that the reforms led to a reduction in emergency department utilization of between 5 and 8 percent. Two other results are consistent with the hypothesis that patients who gained insurance coverage shifted their source of care from hospital emergency departments to physicians' offices. First, visits for nonurgent conditions account for nearly all the decline in emergency department use; Miller finds no significant effect on visits for nonpreventable emergencies like heart attacks. Second, emergency visits declined most during regular office hours when physicians' offices were likely to be open. An analysis of survey data by Long, Stockley, and Dahlen (2012) also finds that emergency department use fell after the

Massachusetts reform. And Kolstad and Kowalski (2012) find that while overall hospital admissions did not fall after the state's reforms went into effect, there was a decline in admissions coming through the emergency room and admissions for preventable conditions.

Like the Milwaukee results on inpatient admissions, Miller's finding that expanding coverage caused emergency department visits to fall can be understood by considering the services available to low-income uninsured patients before the reform. In Massachusetts, a state program, the Uncompensated Care Pool, paid for hospital care for residents with incomes less than 200 percent of the federal poverty level at no cost to the patient. Thus, when these individuals gained full insurance coverage through Medicaid, their access to office-based primary care improved, but there was little or no change in their access to an emergency department and other hospital-based facilities. The cost of emergency department use went up for some low-income individuals who gained subsidized private insurance because of the reforms, as plans sold in the Massachusetts Connector included nontrivial copays for emergency department visits.

Although the literature on health-care utilization and health status of children suggests that it may take time before the health benefits of Medicaid coverage are evident, the results of one recent study suggest that the coverage gains for low-income adults in Massachusetts may have led to a fairly immediate reduction in mortality. Sommers, Long, and Baicker (2014) estimate a county-level difference-in-differences model to examine changes in mortality in Massachusetts relative to other states. They find that the Massachusetts coverage expansion was associated with a significant decline in all-cause mortality of 8.2 deaths per 100,000 adults, approximately a 3 percent effect. Additional analyses indicate that this result is driven by a 4.5 percent decrease in deaths from causes amenable to health care. They find stronger effects for lower-income counties and counties with lower rates of insurance coverage prior to the reforms.

In a similar analysis, Sommers, Baicker, and Epstein (2012) compare all-cause county-level mortality (from mortality statistics), rates of insurance coverage and self-reported health status (from the CPS), and rates of delayed care because of costs from the Behavioral Risk Factor Surveillance System (BRFSS) for three states that substantially expanded Medicaid eligibility for adults since 2000 (New York, Maine, and Arizona) to neighboring states without expansions (Pennsylvania, New Hampshire, and New Mexico). They find that Medicaid expansions increased Medicaid coverage by 2.2 percentage points and decreased rates of uninsurance by 3.2 percentage points, and were associated with a significant reduction in all-cause mortality, particularly for older adults, nonwhites, and residents of poorer counties. In addition, the authors find reduced rates of delayed care because of costs and increased rates of self-reported health status of "excellent" or "very good."

1.5.3 Effects on Providers

Impact of Medicaid Eligibility

In most studies on how Medicaid affects medical-care utilization, the patient is the unit of analysis and the results can be interpreted mainly as demand-side effects: Medicaid reduces the pecuniary cost of receiving care, leading patients to seek more treatment. Because most of these studies identify the effect of Medicaid from either cross-sectional differences or from relatively small changes in eligibility or coverage, a partial equilibrium perspective is probably justified. However, the impact of large policy changes such as the ACA Medicaid expansions will depend on how providers respond to the resulting changes in the overall demand for care and payer mix. A small literature on how physicians and other providers respond to changes in Medicaid eligibility, coverage, and reimbursement policy sheds some light on these issues. Key studies in this literature are summarized in table 1.8.

Several studies examine the response of providers to public insurance expansions. Baker and Royalty (2000) use two years of panel data from the American Medical Association's Survey of Young Physicians to examine the impact of Medicaid eligibility expansions for pregnant women on the percentage of a physician's patients who are poor or on Medicaid. An important feature of their analysis is that they are able to distinguish between physicians in private practice and those in public health settings. They find that increased Medicaid eligibility leads public health physicians to see a greater percentage of poor patients and patients covered by Medicaid. In contrast, they find that an expansion of Medicaid eligibility has no significant impact on physicians in private practice. Survey data indicate that on the eve of the ACA Medicaid expansions, physicians in public health clinics were substantially more likely to accept new Medicaid patients than those in private practice (Decker 2013; Rhodes et al. 2014).

Two recent studies examine how pediatricians responded to the demand changes caused by the CHIP expansion (Garthwaite 2012; He and White 2013). As noted above, a share of the children who enrolled in Medicaid or stand-alone CHIP plans was covered previously by private insurance. As a result of this crowd-out, for many physicians the main effect of the CHIP expansion was a reduction in the amount they were paid for some of their existing patients. Consistent with this, both studies find that the implementation of CHIP led pediatricians to see more publicly insured patients, while at the same time reducing their weekly hours worked.

This decline in physician hours does not necessarily imply that fewer children were receiving care. Rather, physicians may have reduced their hours by spending less time with each patient. Garthwaite considers this possibility by comparing changes in visit length for pediatricians and other types of physicians between 1993 and 2002. He finds suggestive evidence that the CHIP expansion coincided with a reduction in visit length and an increase

Table 1.8 **Studies of effects on providers**

Study	Data	Population	Design	Results
Currie, Gruber, and Fischer (1995)	Vital Statistics 1979–1992; March CPS	Infants and pregnant women	State-year panel with lagged dependent variable. Dependent variables: infant mortality, Medicaid expenditures. Main independent variables: ratio of Medicaid to private fees for ob/gyns, imputed Medicaid eligibility.	Raising the fee ratio by 10 pp. lowers infant mortality by 0.5 to 0.9 pp. Eligibility expansions reduce infant mortality rate but increase Medicaid expenditures, particularly for hospitals.
Gruber, Adams, and Newhouse (1997)	Administrative Medicaid data for Tennessee and Georgia, 1985–1987	Nonelderly Medicaid recipients	Difference in difference using two states (TN and GA). Dependent variables: site of care, total Medicaid costs. Main independent variables: Residence in TN indicator, postexpansion indicator.	After TN increased its Medicaid primary care reimbursements, site of care shifted toward physicians' offices and away from free-standing clinics. Overall Medicaid program costs fell 8 percent.
Gruber, Kim, and Mayzlin (1999)	HCUP hospital discharges from nine states, 1988–1992	Medicaid discharges admitted to the hospital with a diagnosis of childbirth	Dependent variables: use of cesarean section delivery. Main independent variable: Medicaid fee differential.	Larger Medicaid fee differentials between cesarean and natural childbirth lead to higher cesarean section rates in the Medicaid population. The fee differential of Medicaid compared to private insurance can explain 1/2–3/4 of the difference in Medicaid and private cesarean section rates.
Baker and Royalty (2000)	Surveys of Young Physicians, 1987 and 1991	Private and public physicians	IV using simulated eligibility instrument. Dependent variables: percentage of patients who are poor, percentage of patients covered by Medicaid. Main independent variables: imputed Medicaid eligibility, ratio of Medicaid to private fees for total obstetrical care for vaginal delivery.	Positive effect of fees on the number of poor and Medicaid patients seen by young, private, office-based primary care physicians. Negative effect of fees on the number of poor patients seen in a public setting. Expanding eligibility increases physician services to the poor, esp. in public settings.
Duggan (2000)	Administrative data from CA Office of Statewide Health Planning and Development, 1988–1995	Acute care hospitals in CA	Panel of hospitals. Dependent variables: volume of Medicaid patients, hospital revenue. Main independent variable: DSH payments.	Private hospitals are more responsive to DSH incentives than public hospitals. Private hospitals used DSH payments to increase their holdings of financial assets, rather than improve quality of medical care for the poor.

Gray (2001)	National Maternal and Infant Health Survey 1988	Pregnant women	Cohort difference in difference. Dependent variables: low birth weight, premature birth, infant mortality. Main independent variables: Medicaid physician fees, Medicaid coverage.	An increase in Medicaid physician fees of 10 percent relative to the mean results in .074 reduction in the probability of a low birth weight, .035 reduction in the probability of a very low birth weight for Medicaid-insured women.
Duggan (2004)	Administrative expenditure data from CA Department of Health Services	Medicaid beneficiaries	Instrumental variable. Dependent variable: government spending and health outcomes. Main independent variables: county managed-care mandate indicator.	The switch from FFS to managed care for Medicaid recipients in CA was associated with a large increase in government spending, but no improvement in infant health outcomes.
Baicker and Staiger (2005)	Survey of Government Finances, AHA, ARF 1988–2000, Medicare claims 1989–2000	Births and heart attack patients	Repeated cross section of counties. Dependent variables: infant mortality, post-heart attack mortality. Main independent variable: effective and ineffective DSH payments per capita.	Patients in public hospitals in states where DSH funds were diverted experienced no mortality declines. Patients in hospitals in states in which DSH funds were not expropriated experienced significant declines in mortality.
Currie and Fahr (2005)	HCFA; NHIS 1989, 1992, 1993, 1994	Low-income children	Instrumental variables. Dependent variables: probability that a child has Medicaid, utilization of care. Main independent variables: Medicaid managed-care organization penetration rate. Instrument: presence of a 1915b waiver.	Black children are less likely to be covered where Medicaid managed-care organizations are more prevalent. Among those enrolled in Medicaid, higher managed-care penetration is associated with an increase in number of black children who go without doctor visits.
Kaestner, Dubay, and Kenney (2005)	National Natality files 1990–1996	Women likely to be Medicaid eligible	Repeated cross section with county and year fixed effects, state-specific linear trends. Dependent variables: prenatal-care utilization, infant birth weight, preterm birth, use of cesarean section. Main independent variable: presence of voluntary or mandatory Medicaid managed-care plans.	Among white, non-Hispanic women, Medicaid managed care was associated with a 2 pp. decrease in the number of prenatal care visits, 3 to 5 pp. increase in incidence of inadequate prenatal care. Significant increase in incidence of preterm birth (not causal). No effect on cesarean sections.

(*continued*)

Table 1.8 **(continued**

Study	Data	Population	Design	Results
Shen and Zuckerman (2005)	National Surveys of America's Families, 1997, 1999, 2002; ARF; AHA survey files; Urban Institute capitation rate surveys	Urban residents	Difference in difference with propensity score weighting. Dependent variables: continuity of care, use of preventative care, frequency of care, perception of quality. Main independent variable: Medicaid payment generosity index.	Higher Medicaid payment rates increase access and use of care for Medicaid beneficiaries. Little effect on likelihood of receiving preventative care. Significant results are sensitive to choice of control group (uninsured or privately insured).
Aizer, Currie, and Moretti (2007)	California Birth Statistical Master File, and Birth Cohort File, 1990–2000	Births	Repeated cross section with county or mother and year fixed effects. Dependent variables: insurance coverage, use of prenatal care, infant health outcomes. Main independent variable: indicator for location in Medicaid managed-care county.	The prob. a woman started prenatal care in first trimester falls 0.04 to 0.08 when required to enroll in Medicaid managed care. Medicaid managed-care plans are associated with increases in the prob. of low birth weight, prematurity, and neonatal death relative to FFS Medicaid.
Decker (2007)	NCHS National Ambulatory Medical Care Surveys, 1989, 1993, 1998, 2003; ARF	Office-based physicians, nonelderly Medicaid recipients	Repeated cross section with state and year fixed effects. Dependent variables: physician participation in Medicaid, visit duration. Main independent variable: Medicaid-to-Medicare fee ratio.	Higher Medicaid physician fees increase the number of private physicians, esp. in medical and surgical specialties, who see Medicaid patients. Higher fees reduce the difference in visit wait times between Medicaid and privately paying patients.
Decker (2009)	NHIS 1993–2004; NAMCS and NHAMCS 1993/1994, 1998/1999, 2003/2004	Population under sixty-five and not on Medicare	Difference in difference Dependent variables: volume and site of ambulatory care. Main independent variables: Medicaid-to-Medicare fee ratio, insurance status.	Reductions in Medicaid physician fees lead to a reduction in the number of physician visits for Medicaid recipients relative to the privately insured and a shift away from physicians' offices and toward hospital emergency departments for site of care.
Decker (2011)	NHIS 2000/2001, 2008/2009	Children and adolescents	Difference in difference. Dependent variable: indicator for dental visit in the past six months. Main independent variable: Medicaid dental reimbursement fee.	Increases in Medicaid dental reimbursement fees are associated with a greater use of dental care among youths covered by Medicaid: increasing from $20 to $30 leads to a 0.392 pp. increase in prob. of a Medicaid child seeing a dentist in past six months.

Garthwaite (2012)	Community Tracking Survey, 1996/1997, 1997/1998, 2000/2001; NAMCS, 1993–2002	Physicians	Difference in difference. Dependent variables: number of hours spent on patient care, duration of patient visits. Main independent variables: simulated SCHIP eligibility, pediatric specialty indicator.	SCHIP decreased the number of hours spent on patient care, increased the percentage of pediatricians that reported seeing or accepting any Medicaid patients, increased revenues from Medicaid and led to shorter visit lengths for Medicaid patients.
Duggan and Hayford (2013)	State-level Medicaid enrollment, Medicaid managed-care enrollment, and state Medicaid expenditures, 1991–2009	States	State-year panel, with state and year fixed effects. Dependent variables: Medicaid expenditure. Main independent variable: fraction of a state's Medicaid recipients in managed-care plan.	Shifting Medicaid recipients from FFS into managed care did not on average reduce Medicaid spending. This effect varied substantially across states as a function of the state's baseline Medicaid provider reimbursement rates.
Buchmueller, Miller, and Vujicic (2014)	American Dental Association Survey of Dental Practice 1999–2011	Dental practices	Repeated cross section with state and year fixed effects. Dependent variables: publicly insured patient load, overall patient load, participation in Medicaid, wait times. Main independent variable: location in Medicaid state providing adult dental benefits.	When a state adds adults' dental benefits, dentists participate more in Medicaid, see more publicly insured patients without reducing the privately insured patient load, and make greater use of dental hygienists. Wait times increase modestly.
Buchmueller, Orzol, and Shore-Sheppard (2015)	SIPP combined with data on Medicaid dental fees, ADA Survey of Dental Practice combined with data on Medicaid dental fees	Children up to age fifteen Private dental practices Dental practices	Effect of fees identified from changes in fees conditional on state and year fixed effects.	Higher Medicaid fees increase dental visits, the probability a child has dental sealants, the probability that a dental practice treats publicly insured patients.
Freedman, Lin, and Simon (2015)	AHA Annual Survey of Hospitals, 1985–1996; ARF; March CPS	Hospitals	Hospital-county-state-year panel. Dependent variable: indicator for whether a hospital offers a NICU. Main independent variable: Simulated Medicaid eligibility of pregnant women at the state-year level	Medicaid expansions had no stat. sig. effect on NICU adoption by hospitals. In areas where more new Medicaid patients were likely to have previously been privately insured, Medicaid expansions slowed NICU adoption.

in the percentage of visits that were shorter than ten minutes. This response to the implicit reduction in fees associated with crowd-out is consistent with research by Decker (2007) on the effect of changes in Medicaid fees.

It is also possible that part of the increased demand caused by the CHIP expansions was met by nonphysician providers. A recent study examining the response of dental practices to changes in Medicaid coverage of dental benefits for adults highlights the important role that auxiliary providers play in treating Medicaid patients (Buchmueller, Miller, and Vujicic 2014). Although state Medicaid programs are required to cover dental services for children, adult dental coverage is an optional benefit that most states do not provide. The study uses repeat cross-section data from the American Dental Association's annual Survey of Dental Practice to estimate the effect of changes in Medicaid coverage policy on several supply-side outcomes: participation in the Medicaid program, the number of visits by patient insurance status and type of visit, dentists' labor supply, and the employment of dental hygienists.

The results indicate that when Medicaid covers dental care for adults, dental practices provide significantly more care to publicly insured patients. The analysis of employment practices suggests that an important way that dentists respond to increased demand from public insurance is by making greater use of dental hygienists. A ten-point increase in the percentage of a county's adults covered by Medicaid is estimated to increase the probability that a dentist employs a hygienist by 4 percent and the number of visits with hygienists by roughly 10 percent. Other results suggest that the ability of dental practices to respond to Medicaid-induced demand shocks is mediated by state scope of practice regulations. The increase in visits and the use of hygienists is greater in states where hygienists are allowed greater autonomy. A state's scope of practice environment also seems to affect the extent to which increased demand from Medicaid patients leads to crowding. In states with restrictive scope of practice regulations, an expansion of Medicaid dental coverage leads to modest but significant increases in the time that it takes to get an appointment and the average time spent by patients in the waiting room. Waiting times did not increase in states where hygienists are allowed more autonomy.

Impact of Fees

Historically, access to care has been limited by the fact that many doctors do not accept Medicaid patients. Data from the National Ambulatory Medical Care Survey indicate that in 2011–2012, two-thirds of primary care physicians and 70 percent of physicians overall accepted new Medicaid patients (Decker 2013). Because low provider participation is attributed to Medicaid's low payment rates, the ACA includes a provision that temporarily increases Medicaid payment rates for primary care to Medicare levels. A number of studies have examined the relationship between Medicaid

fees and provider participation in the program. Cunningham and Nichols (2005) and Decker (2007) find that higher Medicaid fees are positively associated with the willingness of physicians to treat publicly insured patients. Baker and Royalty (2000) find such a response for private physicians in their sample. Their results suggest that higher Medicaid payments shift the site of care for low-income patients from public health settings to private physician practices. Gruber, Adams, and Newhouse (1997) find a similar result when studying the effect of increased Medicaid payments in Tennessee.

An audit study by Polsky et al. (2015) provides suggestive evidence that despite a problematic implementation, the increase in Medicaid physician payments brought by the ACA led to an improvement in access for Medicaid patients. Researchers posing as patients with different types of insurance contacted primary care practices in ten states to schedule a new-patient appointment. The calls were made during two periods: November 2012 to March 2013, just prior to the implementation of the fee increase, and mid-2014, just after the increase went into effect. Although the percentage of privately insured callers offered an appointment remained constant at 86 percent, appointment availability for Medicaid callers increased to 66.4 percent from 58.7 percent. The percentage of Medicaid callers able to schedule an appointment increased most in states where the increase to Medicare rates led to the largest increase in fees.

Because of the way that changes in payment policy can shift the site of care, increasing payment rates may or may not increase overall utilization. Some studies using cross-sectional data find a significant relationship between Medicaid payment rates and the site of care, but find no significant relationship between payment rates and overall utilization (Long, Settle, and Stuart 1986; Rosenbach 1989; Cohen and Cunningham 1995). However, other studies that analyze changes in fees suggest that access to physician services improves when Medicaid payments are increased (Gabel and Rice 1985; Shen and Zuckerman 2005; Decker 2009; White 2012).

Access problems attributed to low Medicaid fees are a significant concern in the case of dental care as dentists are even less likely than physicians to accept Medicaid (US GAO 2000). Buchmueller, Orzol, and Shore-Sheppard (2015) find that increases in Medicaid dental fees increase the percentage of dental practices that treat publicly insured patients. Their estimates imply supply elasticities of between .12 and .23, which are slightly lower than supply elasticity estimates for physicians (Baker and Royalty 2000; Decker 2007). They and Decker (2011) also find that higher Medicaid fees are positively correlated with dental visits for children. However, the magnitude of the effect is relatively small: a $10 increase in average Medicaid dental fees—a change slightly larger than the difference between the 75th and 25th percentiles for this variable—is predicted to lead to a 2 to 3 percentage point increase in the probability that a publicly insured child has at least one dental visit in a year. Because of this modest response, most of the expen-

ditures associated with a fee increase go for inframarginal visits, making fee increases a costly way to increase utilization.

In addition to increasing access to care, higher provider reimbursement can influence the type of care that Medicaid patients receive. In most states, Medicaid pays obstetricians more for a cesarean section than for a normal delivery, though the differential is generally not as large as it is for private insurance. Gruber, Kim, and Mayzlin (1999) examine how the Medicaid fee differential affects the cesarean rate for Medicaid patients. Theoretically, the effect is ambiguous, depending on the relative magnitudes of a positive substitution effect and a negative income effect. Using 1988 to 1992 data from eleven states, they find that the substitution effect dominates: larger fee differentials lead to more cesarean deliveries.

To the extent that higher fee differentials lead physicians to overprovide cesarean sections relative to what is optimal based on clinical criteria, reducing the differential payment for performing cesarean sections will not only lower program expenditures, but will improve care quality. In other cases, however, the additional care induced by higher levels of reimbursement may be beneficial. Currie, Gruber, and Fischer (1995) use birth data aggregated to the state/year level to investigate the relationship between the ratio of Medicaid to private insurance fees and infant mortality. They find a significant negative relationship between the fee ratio and infant mortality. Gray (2001) examines the relationship between relative Medicaid fees and birth outcomes using a cross-sectional difference-in-differences approach that compares Medicaid births and non-Medicaid births. He finds that women on Medicaid are more likely to deliver infants with low birth weight, but this difference is smaller in states where Medicaid fees are higher. Higher Medicaid fees also increase the receipt of early prenatal care, which may be an important mechanism for the birth weight result.

As a result of eligibility expansions for pregnant women, today Medicaid pays for over half of all births in the United States. Freedman, Lin, and Simon (2015) examine how the changes in coverage brought about by those expansions affected hospital decisions to adopt neonatal intensive care units (NICUs). Theoretically, the way hospitals respond should depend on the extent of crowd-out. In markets with high rates of insurance coverage at baseline, increases in hospital revenue resulting from uninsured patients gaining Medicaid may be more than offset by a decline in revenue from patients who transition from private insurance to Medicaid. Such a decrease in reimbursement for deliveries will make investments in medical technologies like NICUs less profitable.

Freedman and colleagues find that while on average Medicaid expansion was not significantly related to NICU adoption, in areas where more new Medicaid enrollees were coming from private insurance Medicaid expansion led to a slowing of NICU adoption. This negative effect was most

pronounced in states with the lowest Medicaid payment rates. These results are broadly consistent with earlier work by Currie and Gruber (2001) finding that increases in Medicaid eligibility increased access to costly obstetric procedures for less educated women who likely gained insurance coverage as a result of the expansion while decreasing procedure use for more highly educated women, many of whom would have had more generous private insurance in the absence of the Medicaid expansion.

Impact of Disproportionate Share Hospital Payments

Because of Medicaid's low payment rates and the fact that hospitals with large numbers of Medicaid patients also treat many uninsured patients, state Medicaid programs make disproportionate share hospital (DSH) payments to hospitals treating a high volume of low-income patients. Duggan (2000) studies how public, nonprofit and for-profit hospitals in California responded to the introduction of DSH payments in the early 1990s. His results indicate significant differences between public and private hospitals, but little difference between private nonprofit and for-profit hospitals. When DSH patients made Medicaid patients more financially attractive, there was a shift in Medicaid patients from public hospitals to private ones. At the same time, there was a reallocation of uninsured patients in the opposite direction. This pattern is consistent with private hospitals cream skimming the more profitable low-income patients.

Duggan also examines what hospitals that received DSH payments did with that windfall. For public hospitals the increased funding from Medicaid was offset essentially one-for-one by reductions in funding from state and local governments. The DSH payments led to an increase in total revenue for for-profit and nonprofit facilities, both of which used the additional funds to increase their holdings of financial assets rather than investing in new patient-care facilities. Finding no significant relationship between changes in payments arising from the DSH program and infant mortality, Duggan concludes that the increased funding did not improve health outcomes for low-income patients.

Baicker and Staiger (2005) delve more deeply into what happens when states use intergovernmental transfers to divert federal DSH payments. On average, they find that during the first decade of the DSH program states expropriated nearly half of the DSH transfers from the federal government. There was more diversion in larger states, states with more public hospitals, and states where there is a greater difference in the tendency of public and private hospitals to treat poor patients. Like Duggan (2000) they examine the effect of DSH payments on patient health outcomes, though they use differences across state expropriation behavior and hospital ownership to distinguish between "effective" DSH payments that led to net increases in hospital funding and "ineffective" payments that did not. They find that

effective DSH payments led to large reductions in mortality for infants and heart attack patients, whereas DSH payments that were expropriated by state governments had no significant effect on mortality.

Impact of Managed Care

One of the most significant changes in provider reimbursement was the shift toward managed care that began in the early 1990s (figure 1.7). States moved Medicaid enrollees into managed care primarily in an attempt to better control health-care spending. Although managed care is widely credited with reducing the growth in commercial health insurance premiums, the potential for managed care to reduce Medicaid spending is not clear. There is good evidence that much of the savings achieved by commercial managed-care plans in the 1990s came from the ability of plans to negotiate lower prices with providers (Cutler, McClellan, and Newhouse 2000). Since in most states Medicaid reimbursement rates are significantly lower than private fees, price reductions are not a likely source of savings. On the other hand, Medicaid managed-care organizations may be able to reduce expenditures by managing utilization more effectively, for example, by reducing inpatient admissions or emergency department visits. However, even if such utilization efficiencies are achieved, the shift to managed-care contracting is likely to be associated with an increase in administrative costs.

Research on this issue finds little evidence that managed care has produced cost savings. Duggan (2004) examines the impact of managed-care contracting on Medicaid expenditures in California, exploiting variation arising from the way that the state implemented the policy. The state mandated twenty counties to require certain beneficiaries to enroll in managed care. These mandates were implemented on a staggered basis between 1994 and 1999. Because the timing was essentially random, Duggan uses the mandates as instruments for managed-care enrollment. He finds that, contrary to the state's objective, the managed-care mandates led to a large and statistically significant increase in spending. The point estimates suggest that the mandates increased spending by between 17 and 27 percent.

Given that California's Medicaid program long had lower-than-average provider reimbursement rates, it is perhaps not surprising that increased managed-care enrollment did not produce savings. More recent work by Duggan and Hayford (2013) provides further evidence that the effect of Medicaid managed care on program expenditures varies depending on the level of state reimbursement rates. They analyze state-level data on total Medicaid spending and Medicaid managed-care enrollment from 1991 to 2009. When they instrument for managed-care enrollment with the share of the state's population that is subject to a managed-care mandate, the estimated managed-care effect is negative but statistically insignificant. However, models in which managed-care enrollment is interacted with a measure of Medicaid fee generosity indicate that this null effect masks important

heterogeneity among states. The coefficient on the interaction term is negative and significant, implying that in states where Medicaid fees are relatively high, the shift to managed care does reduce program spending. In states such as California where fees are low, managed care is associated with higher expenditures.

Several studies have examined the effect of Medicaid managed care on access to care and health outcomes. Here again, positive or negative effects are theoretically plausible. On one hand, by emphasizing coordinated primary care and making greater use of nonphysician providers, managed-care organizations may improve access to care. Improved access combined with an emphasis on prevention may lead to improved enrollee health. On the other hand, capitated payment arrangements can create an incentive to stint on care, especially for higher-risk enrollees.

Currie and Fahr (2005) use national survey data on low-income children to examine the relationship between state-level Medicaid managed-care penetration and the probability of having at least one physician visit in a year. Overall, their results indicate little relationship between Medicaid managed care and this proxy for access. Kaestner, Dubay, and Kenney (2005) use data from the National Natality Files to test for an effect of county-level Medicaid managed-care penetration on the utilization of prenatal care. Because they do not directly observe mothers' insurance status, they stratify the analysis by education and marital status, two variables that are correlated with Medicaid enrollment. For unmarried women with less than twelve years of education, they find that living in a county with a mandatory Medicaid managed-care program is negatively associated with the number of prenatal visits. However, they find generally similar results for married women with twelve to fifteen years of education, who are much less likely to have Medicaid coverage. Difference-in-differences models that treat unmarried, less educated women as the treatment group and married, more educated women as controls yield generally insignificant results.

In his study on California's county-level mandates, Duggan uses hospital discharge data to examine the effect of managed care on in-hospital infant mortality and the percentage of premature births. He finds no statistically significant effect of managed care on either outcome. Aizer, Currie, and Moretti (2007) also study birth outcomes in California over a similar period and find that managed care is associated with a lower likelihood of receiving prenatal care in the first trimester and an increased likelihood of low birth weight and neonatal mortality. They argue that the main reason for the difference between their results and Duggan's null results is that their analysis focuses more closely on women who were likely to be subject to a managed-care mandate.

Overall, the literature on the effect of Medicaid program parameters on provider behavior yields fairly consistent results. Coverage expansions and increases in reimbursement both increase the quantity of services supplied

to Medicaid patients. Hospitals appear to be responsive to the incentives inherent in the DSH program, though not necessarily in ways that lead to improved outcomes for patients. And there is little evidence that the shift from fee-for-services reimbursement to managed care has led to sizable savings or improved health outcomes. Indeed, some studies suggest the opposite may be true.

With the large increases in adult coverage caused by the ACA, Medicaid will be an increasingly important source of payment for providers, including some that previously had limited experience with the program. Early evidence suggests that for hospitals in states that have implemented the ACA Medicaid expansion there has been a significant reduction in the number of uninsured patients and in the value of uncompensated care provided (DeLeire, Joynt, and McDonald 2014; Nikpay, Buchmueller, and Levy 2015). All else equal, these trends should improve the financial status of hospitals. However, in anticipation of the reduction in the number of uninsured patients, the ACA legislated reductions in the DSH program. When these reductions go into effect, for some hospitals the gain from having fewer uninsured patients will be offset, at least partially, by a reduction in DSH payments.[27]

The results of several of the studies reviewed here suggest that the impact of the ACA expansions on providers will depend on the degree of crowd-out. In cases where a large number of patients shift from private insurance to Medicaid, the main effect of the ACA could be a reduction in average payment rates. As noted above, the ACA also provided federal funding to raise Medicaid physician payment for primary care services to the level of Medicare fees, though only in fiscal years 2013 and 2014. Going forward, states will have to decide whether to use their own funds to continue this "fee bump." The decisions that states make regarding DSH and physician payment rates and the ways that providers respond to these policy choices will be an important area for future research.

Medicaid Reimbursement and Nursing Homes

As noted, Medicaid beneficiaries represent a majority of nursing home patients in the United States. There are a number of studies on how Medicaid reimbursement policy affects the nursing home market. Norton (2000) and Grabowski and Norton (2006) provide good reviews of this literature. One issue that has received considerable attention is the relationship between Medicaid payment levels and nursing home quality. As described in section 1.4.3, the relationship can be positive or negative depending on the extent to which supply-side constraints lead to a situation of excess demand. Several early studies find evidence of a negative relationship between Medicaid pay-

27. The DSH payment cuts were originally supposed to begin in 2014, though they have been postponed until 2017.

ment rates and input-based proxies for quality in individual states (Nyman 1985, 1988; Gertler 1989). However, more recent research finds a positive relationship between Medicaid payment rates and a number of different process and outcome-based measures of quality (Cohen and Spector 1996; Grabowski 2001, 2004; Grabowski and Angelelli 2004; Grabowski, Angelelli, and Mor 2004). In one of the more recent studies, Grabowski (2001) replicates the analysis in one of the earlier papers (Gertler 1989). Applying the methods and quality measures from the earlier study to more recent data, Grabowski finds a positive relationship between Medicaid payment and quality, which suggests that changes in market conditions are at least part of the explanation for the divergent results from the earlier and later studies. In particular, nursing home occupancy rates, an indirect indicator of excess demand, declined substantially between the mid-1970s and early 1990s.

1.5.4 Financial Impacts on Households

Given that a fundamental purpose of health insurance is to protect individuals and families from the financial burden of large medical expenditures, there is relatively little research on the effect of Medicaid on financial outcomes. However, as discussed above there are several channels through which Medicaid may affect family financial well-being, resulting in potential effects on family assets and on measures of financial strain, including bankruptcies.

Gruber and Yelowitz (1999) examine how the amount of a household's expected medical spending that is made eligible for Medicaid affects household net worth and consumption. They construct a measure of expected medical spending made eligible for Medicaid as the product of a binary eligibility variable (imputed for individual women and children in the household) and an age-gender-state-year-specific measure of both current and future medical-care spending; this product is then summed over all members of the household. To deal with the endogeneity of eligibility they create an instrument for this measure of spending in a similar fashion, replacing eligibility with simulated eligibility for a national random sample as in Currie and Gruber (1996a, 1996b). Using data from the Survey of Income and Program Participation for the 1984–1993 period, they find that Medicaid eligibility has a significant negative effect on asset holdings, estimating that a $1,000 increase in potential medical spending eligible for Medicaid leads to a fall of 0.81 percent in the odds of having positive assets and, among households with positive net wealth, a 2.51 percent decline in net wealth (median net worth is $11,171 in their sample). They also find a positive effect on consumption levels: for each $1,000 in eligible spending, they estimate that nondurable expenditures rise by 0.82 percent. The estimates are even larger for states that maintained an asset test for eligibility for women and children over this period. They conclude that parameters of the Medicaid program are a major determinant of the savings behavior of low-income households.

However, subsequent research has shed additional light on these results. Using instrumental quantile regression on Gruber and Yelowitz's data, Maynard and Qiu (2009) find that the effects of Medicaid are concentrated in the middle of the net worth distribution, disappearing entirely not only at the top end of the wealth distribution, but also for the lowest net worth households, with no discernible effect of Medicaid on the savings of the bottom 20 percent of households. Moreover, Gittleman (2011) analyzes data from the National Longitudinal Survey of Youth as well as the SIPP and finds that the results are not robust to cohort, to inclusion of some two-way interactions, and to the use of only eligible spending for the current period rather than including spending that will occur in the future assuming Medicaid rules remain the same and the family's income does not change. In addition, he finds no evidence of an effect of eligibility on wealth for later expansions. This pattern is consistent with other findings that indicate the earliest Medicaid expansions that include some AFDC eligibility and were targeted toward poorer families had the most substantial effects on a variety of outcomes.

The results on saving impacts of Medicaid for the elderly are similarly equivocal. DeNardi, French, and Jones (2010) estimate a life cycle model of saving on a sample of single, retired elderly individuals. Their focus is on explaining saving behavior among the elderly in general, so they do not model Medicaid explicitly, but they include a consumption floor that represents Medicaid and Supplemental Security Income benefits for the elderly. In simulations of their model they find that a reduction in the consumption floor results in an increase in saving among both low-income and high-income elderly. It is important to note, however, that the consumption floor in their model represents cash assistance as well as medical-spending assistance. By contrast, Gardner and Gilleski (2012) carefully include details of Medicaid eligibility in their dynamic model of long-term care arrangements, Medicaid enrollment, assets, and gifts. They find that the elderly are only responsive to a few Medicaid policies, particularly policies affecting home- and community-based services eligibility and generosity. They find small and insignificant effects of policies that affect nursing home services eligibility and generosity.

Several recent studies have focused on the impact of Medicaid on measures of financial strain. Gross and Notowidigdo (2011) exploit the variation provided by expansions between 1992 and 2004 to examine the effect of Medicaid eligibility on bankruptcies, applying a simulated eligibility instrumental variables model to state-level data. Their results imply that a 10 percent increase in Medicaid eligibility reduces personal bankruptcies by 8 percent. They then use their estimates to calibrate a theoretical model. The results of this exercise imply that out-of-pocket medical costs are pivotal in roughly a quarter of personal bankruptcies among low-income households.

In their randomized control trial in Oregon, Finkelstein et al. (2012) analyze the impact of Medicaid coverage on multiple measures of financial strain. The analyses are based on both administrative and survey data. The administrative data are from the Consumer Credit Database of the credit bureau TransUnion and include such things as delinquent credit accounts, bills sent to collection agencies, bankruptcies, liens, and judgments. The survey questions ask about medical expenditures and debt and whether respondents had to borrow money or delay paying other bills in order to pay medical bills. They find that Medicaid coverage is associated with a significant decline in the probability of having a bill sent to collection and this result is driven by a decline in medical collections. They find no significant decline in bankruptcies or liens, which are less common events that occur with a greater lag than collections. The survey results indicate large, statistically significant declines in out-of-pocket medical expenditures and the probability of having to borrow money or skip paying other bills because of medical expenses.

Mazumder and Miller (forthcoming) use similar credit report data to examine the effect of the 2006 Massachusetts health care reform on financial outcomes for those who were uninsured before the reforms. The credit report data are from the Federal Reserve Bank of New York's Consumer Credit Panel. They use a triple-difference regression model that compares consumers in Massachusetts with those in other states, and within states, compares individuals in areas with high and low rates of insurance coverage prior to the reforms. They find that the Massachusetts reform led to significant improvement in credit-risk scores while significantly reducing the fraction of debt past due, the incidence of bankruptcy in the last twenty-four months, and (at the 10 percent level) total collections.

While the impact of Medicaid on financial well-being is an important area for future research, the studies that have been done thus far point to two important conclusions. First, the existence of Medicaid and its policies can dissuade households from saving, although the effects do not seem to be particularly large and they appear to be concentrated among lower-middle-income households rather than among the poorest. Second, coverage by Medicaid reduces measured financial strain, improving household financial well-being.

1.5.5 Impact of Medicaid on Labor Supply and Program Participation

Prior to the expansions in eligibility beginning in the mid-1980s, researchers interested in identifying the effect of Medicaid on labor force and welfare participation faced the issue that it was difficult to tease out separate effects of cash payments and health insurance when one benefit always accompanied the other. To address this issue, researchers attempted to distinguish different potential values of Medicaid for different potential recipients. For example, Moffitt and Wolfe (1992) develop a proxy for the dollar value of

Medicaid for each family that takes into account actual health conditions in the family. They find that the value of Medicaid affects welfare participation, but only for families with high expected medical expenses.

By separating the receipt of Medicaid benefits from welfare participation, the eligibility expansions offered researchers the possibility of observing explicitly the impact of becoming eligible for Medicaid. Yelowitz (1995) was the first to investigate the delinking of Medicaid from welfare on AFDC participation and on labor market participation. Using data from the March CPS for 1989–1992, he examines the relationships between each of these participation decisions and the difference in the maximum income limits conferring only Medicaid eligibility for the youngest child and the maximum income limits permitting AFDC eligibility. He estimates a probit model for both AFDC participation and for labor market participation, and finds that a larger difference strongly and significantly decreases AFDC participation and increases labor market participation. He concludes that the Medicaid expansions had a strong positive effect on labor market participation of women heading families with children.

However, Ham and Shore-Sheppard (2005a) note a peculiar feature of Yelowitz's specification: the effects of the Medicaid income limits and the AFDC income limits are constrained to be equal in magnitude but opposite in sign. Ham and Shore-Sheppard show that imposing this constraint is not consistent with economic theory, since it implies that welfare benefits had no effect on labor force or welfare participation in the period prior to the decoupling of Medicaid and AFDC. They consider probit equations for AFDC and labor force participation using March CPS data from both Yelowitz's sample and a slightly longer time period (1988–1996). Using Yelowitz's specification, they generally replicate his results; however, when Medicaid and AFDC income limits are allowed to have separate coefficients, they find that only the AFDC income limits significantly affect AFDC and labor market participation. They conclude that the Medicaid expansions did not affect the labor market behavior of women heading families with children; Yelowitz's results were driven by the imposition of a constraint that is not supported by either theory or the data.

Meyer and Rosenbaum (2001) consider the effect on labor force participation of several programs simultaneously, including Medicaid. They model expected utility when working and not working and include the value of Medicaid coverage if a woman works and the value of Medicaid coverage if she does not work (using the per capita cost of Medicaid to determine the value) in their model. Using data from the CPS Outgoing Rotation Group Files and the March CPS 1984 to 1996, they find little effect of Medicaid on the employment decisions of single mothers.

The result of Ham and Shore-Sheppard (2005a) and Meyer and Rosenbaum (2001) that Medicaid coverage has no effect on labor supply is puzzling since the dollar cost of this coverage is nontrivial. However, this puzzle is potentially resolved by the finding in Finkelstein, Hendren, and Luttmer

(2015) that low-income adults value Medicaid coverage only at 20–40 percent of a dollar spent by the government. Given their results, we would not expect adding or eliminating Medicaid coverage to have large labor supply effects.

The research just discussed focusing on expansions of Medicaid to children and pregnant women found little effect of expanded Medicaid on labor supply except among families with a priori high medical costs. However, expanded availability of Medicaid may have additional effects on labor market behavior beyond participation. Hamersma and Kim (2009) investigate whether the parental Medicaid expansions increase job mobility. The idea is that if individuals obtain coverage through Medicaid, they will be more mobile since they do not need to stay on their current job just for the insurance coverage provided by the job. On the other hand, expanded eligibility could decrease mobility for those without health insurance, since there is now less pressure to move to a job that offers health insurance. Using data from the 1996 and 2001 SIPP panels they estimate a probit equation for quit behavior, which depends on the Medicaid eligibility income threshold determined by family size, state, and month, as well as controls for demographics, current labor market conditions in a state, and state and year dummies. They find that higher Medicaid thresholds lead to greater job turnover, but only among unmarried women.

While all of the research discussed in this section thus far has focused on the labor market impacts of Medicaid expansions for low-income families with children, more recent research has examined the impact of eligibility changes for low-income nondisabled adults without children that occurred in individual states, including Tennessee, Wisconsin, and Oregon. Since the ACA targeted such adults, these studies provide very useful information about the likely impacts of the ACA on the labor market, although it is important to keep in mind that the experiences of individual states may not be entirely applicable to the impacts on the country as a whole.

The study by Garthwaite, Gross, and Notowidigdo (2014) focusing on Tennessee also examines the effect the large disenrollment of childless adults on their employment. Using the same approach that they use to analyze crowd-out (a difference-in-differences model comparing adults in Tennessee to adults in other southern states and a triple-difference model contrasting outcomes for childless adults and other adults), they estimate that the forced disenrollment led to a 2.5 percentage point increase in employment using the difference-in-differences model or a 4.6 percentage point increase using the triple-difference model. (To put these results in perspective, the employment rate in the Tennessee sample was 69 percent.) Scaling by the estimated impacts on public coverage suggests that employment rose by approximately 63 percent among former TennCare enrollees. These are sizable effects, although the confidence intervals are fairly wide.

Dague, DeLeire, and Leininger (2014) study a policy change in Wisconsin, where enrollment into Wisconsin's Medicaid program for childless adults

with household incomes below 200 percent of the federal poverty level was suddenly suspended in October 2009, with everyone who attempted to enroll after the cut-off date being placed on a waiting list. Dague, DeLeire, and Leininger use a regression discontinuity approach to measure the impact of this policy change. They use state administrative records on enrolled and wait-listed applicants and earnings records from Wisconsin's unemployment insurance system and compare outcomes for those who enrolled before the announcement to those who were wait listed after the announcement. Both recipients and wait-listed applicants increased their labor supply over the time period of the study, though nonrecipients increased their labor supply by more. Using wait-listed applicants as a control group implies that enrollment into public insurance led to a reduction in employment of about 5.5 percentage points (a reduction of 12 percent), with a net effect on quarterly earnings of $300.

Finally, Baicker et al. (2014) measure the labor market impacts in the Oregon lottery experiment. They estimate intent-to-treat (ITT) models that compare labor market outcomes including employment status and earnings among the treatment group to outcomes in the control group. They also estimate the impact of being covered by Medicaid (the local average treatment effect) using lottery status as the instrument for Medicaid coverage. They find no statistically significant impact of Medicaid on any of their labor market outcomes. Their point estimate for the LATE for employment is a decline of 1.6 percentage points (or about 3 percent, relative to the control group), and despite its statistical insignificance the confidence interval is tight, allowing Baicker et al. to reject a decline in employment of more than 4.4 percentage points or an increase of more than 1.2 percentage points.

Taken together, the three sets of estimates from the three different states suggest substantially different magnitudes of Medicaid effects on employment for childless adults, from close to no effect in the Oregon study, to a 12 percent reduction in employment among recipients in the Wisconsin study, to a 60 percent increase in employment among disenrollees following disenrollment in the Tennessee study. Dague et al. suggest that part of the explanation for the differences in the estimates is the economic conditions prevailing at the time of the policy changes, noting that the state unemployment rate was 5.6 percent in Tennessee in 2005, 11.1 percent in Oregon in 2009, and 8.5 percent in Wisconsin in 2010. In addition, Oregon's program was available only to individuals with incomes below the poverty level, while Tennessee's and Wisconsin's were both available to individuals with incomes up to twice the poverty level, suggesting that employment effects may be less likely when the program is targeted at lower-income individuals.

1.5.6 Effects of Medicaid on Family Structure

As discussed in section 1.4, Medicaid may well have impacts on family structure both by affecting marriage probabilities and by affecting fertility.

There has been very little research on the impact of Medicaid per se on marriage, though there is a long literature on the impact of AFDC and other cash welfare programs on marriage. The main results on the impact of Medicaid on marriage come from Yelowitz (1998), who looks at the probability a woman is married as a function of whether all of her children are age-eligible for Medicaid or whether any of her children are age-eligible using variation in eligibility by state, year, and age of child caused by the eligibility expansions for children of the late 1980s and early 1990s. He finds that women with all children eligible are 1.5 percentage points more likely to be married than women with at least one ineligible child, but he finds no effect for women with only some of their children eligible. Yelowitz notes that at least some of the effect that he finds may be due to selection into childbearing as a result of the expansions, but the results suggest that the marriage effect is likely to outweigh the selection effect.

The effect of Medicaid on childbearing is a more active research area. Studies in this area have considered three possible avenues by which Medicaid might affect fertility. First, expanded eligibility for pregnant women, infants, and children reduces the cost of having a child. Second, differences across states in whether Medicaid funds abortions may lead to differences in abortion rates. Third, the fact that Medicaid covers the cost of contraception for certain groups may reduce pregnancies.

To study the first avenue, expanded eligibility, researchers have compared birth and abortion rates for groups of women who were more or less likely to be eligible for Medicaid for exogenous reasons. Joyce and Kaestner (1996), an early paper in this area, use vital statistics data from three states and a difference-in-differences approach that compares outcomes before and after a Medicaid eligibility expansion for groups defined by race, marital status, and education level. Their results suggest that the eligibility expansion led to a decline in the abortion rate for unmarried, nonblack women with less than a high school degree, a group that was more likely to gain eligibility. However, since women with higher levels of education may still be income-eligible for the expansions, this method may result in misclassification, particularly for black women.

Joyce, Kaestner, and Kwan (1998) use state-quarter-race specific data from fifteen states and examine the association between birth and abortion rates and Medicaid expansion using indicators for the state expanding eligibility to the poverty level and for the state expanding to 185 percent of the poverty level, controlling for state, year, quarter, and state-specific linear trends. The identification is thus from changes in eligibility over time within a state. They find that increased eligibility is associated with a 5 percent increase in the birth rate for white women, but find no significant association for black women, and no effect on abortions. However, because they do not control for other changes that might be occurring within a state over the time period, their results are suggestive rather than definitive.

DeLeire, Lopoo, and Simon (2011) try to take advantage of within-state variation in eligibility by creating age-education-marital-status demographic cells and using Currie and Gruber's simulated eligibility index to obtain a measure of eligibility at the state-year-demographic-cell level. Controlling for a variety of welfare policies and the state unemployment rate in addition to the simulated eligibility index, they find fertility is positively associated with the expansions for both whites and blacks, but once they include fixed effects for demographic cells the relationship disappears entirely. Zavodny and Bitler (2010) use a similar methodology over a somewhat longer time period. They use alternatively the Medicaid eligibility threshold applying in a demographic cell or the fraction of women in a cell who would be eligible, control for additional policy changes (including the Earned Income Tax Credit), and simultaneously examine the impact of Medicaid-funding restrictions on abortion. They find some evidence of higher birth rates among whites with less than a high school education in response to expanded eligibility thresholds, but no statistically significant effect when the simulated fraction eligible is used to measure eligibility. The results from these two papers suggest that any impact of Medicaid eligibility on fertility is limited and not particularly robust.

Zavodny and Bitler do find that restrictions on Medicaid funding of abortions are associated with decreases in abortion rates and increases in birth rates. This latter result generally accords with the earlier literature on Medicaid funding of abortion (e.g., Haas-Wilson 1996; Blank, George, and London 1996; Levine, Trainor, and Zimmerman 1996; Kane and Staiger 1996), at least in finding decreases in abortion rates. The results in the literature for birth rates are somewhat more equivocal, however, with some authors finding birth-rate increases (Currie, Nixon, and Cole 1996; Zavodny and Bitler 2010) and others finding birth-rate decreases (Levine, Trainor, and Zimmerman 1996; Kane and Staiger 1996).

Researchers have also studied other possible effects of Medicaid abortion-funding restrictions. Bitler and Zavodny (2001) find no significant effect of Medicaid funding restrictions on abortion timing, while Currie, Nixon, and Cole (1996) find no evidence of an effect on birth weight. Currie, Nixon, and Cole also find suggestive evidence of policy endogeneity in Medicaid abortion-funding laws, with restrictive laws having the same effect whether or not they are enjoined by the courts and finding similar effects on high-income and low-income women. Sen (2003) finds no relationship between Medicaid funding restrictions and rates of sexually transmitted diseases among women, suggesting that Medicaid funding restrictions do not lead to increased use of safe sex behavior that prevents sexually transmitted disease, although the use of contraceptive methods such as the pill would not be detected with such an empirical strategy.

Examining contraception more directly, Kearney and Levine (2009) estimate the impact of Section 1115 waivers obtained by states to extend

Medicaid family-planning services to women who would otherwise not be eligible for them. They identify states and time periods with two types of waivers—expansions of family-planning eligibility based solely on income and extensions of family-planning eligibility to women who would otherwise lose eligibility postpartum. Using data from the Medicaid Statistical Information System and similar older data, they show that waivers, and particularly income-based waivers, were associated with larger proportions of women reported to be receiving Medicaid family-planning services. Looking at birth rates by state and year and controlling for state effects, year effects, time-changing variables for states, and state-specific linear and quadratic time trends, they find that the presence of an income-based waiver reduces births by around 2 percent for nonteens and between 4.2 and 4.7 percent for teens. They also find evidence in individual data of changes in the probability of contraceptive behavior for women in states with a waiver in effect. They find that it is a relatively cost-effective approach to reducing unwanted births.

1.6 Summary and Future Research Questions

Medicaid is a massive, multifaceted program touching almost every aspect of the health care and long-term-care delivery systems. It has achieved its objectives along many dimensions, covering a substantial percentage of the population, particularly children, increasing access to care, improving some measures of health, and providing some financial benefit to recipients. It has also, however, led to some substitution away from private insurance, particularly insurance for long-term care, and the level and nature of compensation paid to health-care providers has engendered an array of problems and concerns. Nevertheless, with the covered population expanding considerably under the ACA, Medicaid has moved from the margins to the mainstream. To conclude this chapter, we discuss some areas that we see as being important for future research.

Unsurprisingly, many of these areas concern the ACA. First, there is the question of the impact of states' decisions about whether and how to participate in the ACA expansion of Medicaid. What are the implications of these decisions in terms of fiscal pressures on states or the federal government? How much will fiscal pressures increase as Medicaid is used to finance coverage for growing subsets of the population? States' decisions also have implications for individuals, both in states that do and do not choose to participate. In nonparticipating states, one question is how is inequality in access to health care changing, and what are the implications of the continuing lack of insurance coverage for many low-income adults in terms of health and financial well-being? In participating states, the expansion of Medicaid eligibility to new groups brings new dimensions to old questions of take-up, crowd-out, labor supply, and job lock. In addition, there is the

added dimension of the interaction between Medicaid and the insurance exchanges. How well integrated are the public and private dimensions of the exchanges, and how easily can individuals experiencing changes in their circumstances move from one type of coverage to another?

There are also perennial issues that are brought to the fore by the ACA, such as the relationship of the Medicaid program with providers. As we have noted, Medicaid does not compensate providers well, in general, and the question of supply of care to the insured will be an important one. In addition, there are important implications for the well-being of providers, particularly those that serve a large share of Medicaid patients, of increasing the share of Medicaid coverage in the market. Since the writers of the ACA recognized these issues and built in temporary reimbursement increases for some providers, it will be important to see how provider behavior and patient well-being are affected both by the increase and by its disappearance.

There is also the continuing and essential question of the impact of Medicaid on health. While there have been some important recent advances with the Oregon health study, health effects for adults, including for the disabled and elderly, are not well understood and thus far have been little studied. Finally, we need a better understanding of the financial impacts, again for all eligible groups, of Medicaid coverage. With expenditures of nearly $390 billion, measuring the benefits as well as the costs of this major program is crucial.

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