The Efficacy of Primary Care for Vulnerable Population Groups

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This article reviews the existing literature on the efficacy of primary care with an emphasis on the evaluation of primary care for vulnerable populations: groups whose demographic, geographic, or economic characteristics impede or prevent their access to health care services. A significant portion of the literature derives from studies of poor and underserved populations. However, to construct a more complete evaluation of primary care services, the authors cite literature that has examined both advantaged and disadvantaged populations. Even then the literature is incomplete, at best. The article describes a definition of primary care suitable for policy analysis and formulation, reviews evidence on the efficacy of care that meets that definition, and concludes that widespread use of primary care services is likely to result in improved patient satisfaction and health status.

Key Words. Efficacy, primary care, literature review

One of the fundamental goals of health care reform is to provide underserved and vulnerable populations with increased access to health care services such as primary care. Scholars pay rhetorical tribute to the value of primary care (e.g., Budetti 1993), and tout primary care as one of the major advantages of universal health insurance systems abroad (Starfield 1991), of the Hawaiian health care system (Holoweiko 1992), and of the accountable health plans envisioned by advocates of managed competition (Ellwood, Enthoven, and Etheredge 1992). Yet the empirical basis for this celebration of primary care has rarely been examined.

DEFINITIONS OF PRIMARY CARE

Despite the widespread use of the term, the definition of primary care is not straightforward. After reviewing dozens of definitions, the Institute of Medicine (IOM) (1978) concluded that primary care differs from other types of health care because of the scope, character, and integration of the services provided. The report went on to define five attributes as essential to the practice of primary care: accessibility, comprehensiveness, coordination, continuity of services, and accountability. In a later study, the IOM (1984) expanded the concept of primary care to include attention to the needs of a specific community through specific health programs and services.

Starfield (1992) has proposed a definition of primary care that is similar to the IOM's and focuses on four specific attributes. She defines it as first-contact care that is longitudinal, comprehensive, and coordinated. She has also described ways to evaluate whether these goals have been achieved (Starfield 1991, 1992) for groups of patients (Starfield 1986) and for a national health care system (Starfield 1991). For the purposes of this review, we will adopt her definition, both because it is relatively straightforward and because the literature on ways to define, measure, and evaluate the attributes she identifies is reasonably well developed.

The *first-contact* attribute of primary care indicates that the provider is the point at which individuals seek entry into the health care system when a problem or need arises (Starfield 1991). To be first-contact care, primary care must be readily accessible, patients must use it to gain access to all or most necessary services, and its practitioners must take responsibility for managing the utilization of all those services, including specialty care. The term "gatekeeping" is often used to subsume some of the first-contact functions of primary care as defined by Starfield (e.g., Franks, Clancy, and Nutting 1992).

One aspect of first-contact care, its accessibility, can be measured using indicators of "potential" or "realized" accessibility (Aday, Fleming, and Andersen 1980). Indicators of potential accessibility document the physical or structural availability of care, such as the presence in a community of health care facilities and personnel, the ease with which appointments can be made, and the hours during which facilities or personnel are available to patients. Measures of realized access comprise actual utilization rates, such as the number of visits to a physician over a given period of time.

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Longitudinality as an aspect of primary care means that the caregiver is the principal provider of care to the patient over time. Longitudinality implies an ongoing relationship between patient and provider. Surveys of populations may assess longitudinality by asking respondents whether or not they have a usual or regular source of care (Starfield 1992). Longitudinality can also be measured in terms of the proportion of patients' visits that are made to a single provider during a given period of time.

Comprehensiveness in primary care means that "primary care facilities must be able to arrange for all types of health care services, even those not provided efficiently within the facility" (Starfield 1992, 18). The range of services includes preventive care, acute care, referral and consultative services, psychosocial services, and family planning. Indicators of comprehensiveness are less rigorous than and not as well established as those for accessibility and longitudinality.

The last attribute of primary care, its *coordination*, means that the provider is capable of integrating all the care that patients receive. Various means may be used to promote such coordination, including effective information systems, physical proximity of providers, and use of a single provider over time (longitudinality). It is important to recognize, however, that coordination may exist in the absence of longitudinality. For example, treatment of an episode of illness in an emergency room or urgent care center may be perfectly coordinated, yet no ongoing relationship between patient and provider may have existed prior to that episode of illness, and none may develop subsequent to it (Starfield 1992).

A number of measures have been used to assess the coordination of care. Some focus on the extent to which a single provider is used during an episode of illness (as opposed to over a period of time, as in longitudinality). Others track the extent to which providers have access to information about the patient when it is needed. For example, Dietrich and associates (Dietrich, Nelson, Kirk, et al. 1988) and Fletcher and associates (Fletcher, O'Malley, Fletcher, et al. 1984) propose that coordination be measured in terms of the extent of providers' awareness (as documented in medical records) of all the care a patient receives.

Though discrete in concept, the specific attributes of primary care delineated above are obviously interrelated in practice. The literature implicitly recognizes both their separability and their interdependency. Thus, some studies isolate certain aspects of primary care for study (such as longitudinality or coordination), and others treat it as an undifferentiated whole. In reviewing the literature on the efficacy of primary care in vulnerable populations, we will first discuss the empirical work on undifferentiated primary care and then cover studies that look at its discrete qualities. We define vulnerable populations as those groups whose demographic, geographic, or economic characteristics impede or prevent group members' access to health care services.

We have confined our literature review to studies that assess primary care delivered by physicians. We recognize that nonphysician practitioners, such as nurse practitioners, physician assistants, and midwives, play an important and expanding role in meeting the primary care needs of Americans (Fry 1976; Dignan, Hall, and Hastings 1979; Brooks and Johnson 1986), but that role is beyond the scope of this article.

STUDIES OF THE EFFICACY OF PRIMARY CARE SERVICES

UNDIFFERENTIATED PRIMARY CARE

A variety of studies have examined the effect of undifferentiated primary care on a number of indicators of the processes and outcomes of care. For the most part, these studies rely either on surveys of affected populations before and after a primary care intervention, or on cross-sectional studies in which communities benefiting from an intervention are compared to similar communities that were not exposed to it. The largest category of such studies looks at the effect of community-based interventions, such as community health centers, on health status and the costs of services individuals and communities consume. Many of these studies evaluate interventions that were specifically aimed at the underserved.

Community-Based Interventions

Community Health Centers. Since the mid-1960s, federal, state, and local governments have subsidized the operations of community health centers (CHCs) in inner cities and rural areas. The purpose of CHCs has been to provide comprehensive primary care services to vulnerable populations that have inadequate access to services of any type, or that would otherwise be reliant on sources of care, such as emergency rooms, that often lack the attributes of true primary care (Blumenthal 1975; Sardell 1988; Patton 1990).

Although new evaluations are in progress (personal communication, Anne Zuvekas, 1992), most published studies of CHCs date from the 1970s and early 1980s. Their relevance to the current functioning of CHCs is therefore open to question. They also suffer from methodologic limitations. Nevertheless, their results show considerable agreement, which tends to add to their credibility. We look first at studies of the effect of CHCs on the process of care, and then at evaluations of their effect on outcomes, including health status and cost of services.

With a few exceptions, studies of the effect of CHCs on the process of care have tended to show reductions in the use of the institutional care and inpatient services, and improvements in access to services. Okada and Wan (1980) surveyed residents in five inner-city communities before and after the introduction of community health centers to those areas in the late 1960s. They found that respondents in the follow-up survey reported increased use of CHCs as their usual source of care and decreased use of hospital clinics and private physicians' offices.

Okada and Wan also found that, controlling for respondents' age and the presence of a chronic condition, uninsured users of CHC services reported more physician visits than uninsured residents relying on hospitals or physician offices as their usual source of care. Interestingly, there was no increase in the proportion of respondents in surveyed communities reporting that they had a usual source of care. This suggests that the major effect of CHCs was to draw patients away from institutional settings and private offices and to increase the availability of services to uninsured users of care, rather than to expand the number of individuals in contact with the health care system.

Hochheiser, Woodward, and Charney (1971) reported that the number of visits to emergency rooms by children living in census tracts in Rochester, NY, served by a CHC fell 38 percent in the three years after its opening. Among children living elsewhere in Rochester, emergency room visits stayed the same or increased. Freeman, Kiecolt, and Allen (1982) found a dramatic fall in the proportion of residents reporting the emergency room as their usual source of care after a CHC was introduced in East Palo Alto, California. In contrast, Moore, Bernstein, and Bonanno (1972) found no fall in emergency room use at one inner-city hospital on the part of residents of a neighborhood served by a new CHC. However, this particular study was unable to assess whether emergency room use fell at other hospitals, among members of the study group.

Reanalyzing Okada and Wan's data, Freeman, Kiecolt, and Allen (1982) found that users of CHCs in five communities were admitted to hospitals less frequently than were respondents reporting other usual sources of care. The authors adjusted for a number of potential confounding variables.

This is one of several studies suggesting that the provision of care by a CHC may reduce patients' consumption of inpatient services. Other studies suggest that this reduction is achieved without compromising outcomes of care.

In fact, studies of outcomes of care have suggested that CHCs may favorably affect the health status of users of these sources of primary care (Zuvekas 1991). Deprez, Pennel, and Libby (1987) found that, after adjustment for age and sex, users of CHCs in rural Maine had significantly fewer preventable hospitalizations during 1980 than nonusers. Klein et al. (1973) also found a lower rate of preventable hospital admissions among pediatric users of a Rochester, NY, CHC than among nonusers. O'Connor, Wagner, and Strogatz (1990) found that adults who identified a community health center as their usual source of care were significantly more likely than other residents of a rural community to have their hypertension detected, treated and controlled. The analysis controlled for patients' age, sex and race.

Evidence of the effect of CHC use on the costs of care is sparse. Perhaps the best data were reported by Duggar, Balicki, and Zuvekas (1981). They studied utilization and cost of services in the late 1970s among Medicaid beneficiaries who used CHCs for at least 50 percent of their care, compared to Medicaid recipients in the same communities who did not. Only patients eligible for Aid to Families with Dependent Children were included in the study. At all three sites, use of ambulatory services was higher for CHC users than nonusers, but visit rates to hospital outpatient departments were lower, resulting in lower overall ambulatory costs for CHC users. Use of hospital services (admission rates and total hospital days) was lower for users than nonusers at all sites, and annual hospital costs were lower at two of the three CHCs. Annual per capita costs for CHC Medicaid users were lower than for nonusers at all three sites. Unfortunately, the study has methodologic limitations due to inadequacies in Medicaid information systems and the difficulty of generalizing from three CHCs and three communities to the rest of the nation.

In contrast, an examination of chronically ill patients transferred from a Houston outpatient department to CHCs in a public hospital district showed an increase in the cost of care resulting from more intensive use of office visits and laboratory and screening services at the CHCs in the six months following the patients' referral (Goodrich and Anthony 1980). To determine whether this increased cost was transient or long-standing, and whether it reflected more appropriate care, would have required more in-depth study. Thus, the effects of CHCs on the cost of care, quality of care, and health outcomes remain unclear.

Other Community-Based Interventions. A variety of other programs have attempted to increase access to community-based primary care in underserved communities. Some of these programs may, in fact, have closely resembled CHCs, but their characteristics have often been poorly defined. Like studies of CHCs, studies of patients served by these primary care programs have demonstrated increased use of ambulatory services overall, reduced use of emergency room care, and reduced rates of hospitalization. In one of the earliest evaluations of the effects of a comprehensive primary care clinic, Alpert, Heagarty, Robertson, et al. (1968) reported that treatment of pediatric patients in a comprehensive setting within a teaching hospital led to fewer hospitalizations, surgeries, and laboratory tests and to increased patient compliance as compared with patients using traditional outpatient services. Sussman, Rosen, Siegel, et al. (1979) found similar results in adult patients treated in a comprehensive primary care program within a hospital outpatient department.

Fleming and Andersen (1986) examined patterns of care among users and nonusers of municipally funded primary care clinics in five underserved areas of New York City. After controlling for a variety of potentially confounding variables, the researchers found that clinic users had fewer visits to emergency rooms and outpatient departments, but larger numbers of ambulatory visits overall, than other community residents. Gordis and Markowitz (1971) found that newborn infants from a poor neighborhood, who were randomized to comprehensive care at a Baltimore teaching hospital, were more likely after one year than a control group to be immunized against polio. There were no other differences in process of care between the groups, but the small numbers of enrollees limited the study's power.

Several studies have examined the effects of community-based primary care programs on the outcomes of care among beneficiaries of these programs. One of the most important was a study by Gordis (1973) that examined the effectiveness of "comprehensive care programs" in preventing rheumatic fever, a complication of strep throat, among children in largely black, inner-city neighborhoods of Baltimore. Unfortunately, the precise nature of the comprehensive care programs was not defined. Gordis found that the incidence of rheumatic fever fell by 60 percent in census tracts served by the new programs. In census tracts adjacent to those served by the new programs, but outside the formal catchment areas, rates of rheumatic fever fell, but not as much as in targeted neighborhoods. In inner-city areas not adjacent to the formal catchment areas of the programs, the incidence of rheumatic fever remained unchanged. This pattern of findings suggested a declining effect of the new primary care program as distance from the clinics increased. Gordis made a careful attempt to control for confounding factors.

Dignan, Hall, and Hastings (1979) found a greater fall in cardiovascular mortality in an isolated, low-income county of Tennessee with a new system of rural health clinics than in a similar county without this new primary care system, which relied primarily on nurse practitioners. In a very different type of study, Grossman and Jacobowitz (1981) used cross-sectional regression analysis to examine the effect of maternal and infant care projects on rates of decline in infant mortality. They found that the presence of such programs within a county was significantly associated with more rapid rates of decline in infant deaths, though the effect size was small compared to other factors, such as income, education, abortion rates, and availability of family planning services.

As with studies of CHCs, studies of the effects of community-based primary care programs on costs of care are few and inconclusive. Fleming and Andersen (1986) attempted to examine total costs of care for users and nonusers of a system of municipal clinics. They found a trend toward lower overall expenditures that reached statistical significance only for Medicare patients. Sparer and Anderson (1972) showed that there may be an initial, transient, surge in utilization and costs immediately after underserved populations enroll in a primary care program.

Other Studies of the Efficacy of Undifferentiated Primary Care

A variety of other studies have assessed directly or indirectly the effect of primary care services on users. Perhaps the most important of these studies involve analyses of natural experiments in which access to primary care was withdrawn from a vulnerable population group, and the results followed over time.

Lurie, Ward, Shapiro, et al. (1984, 1986) followed a group of patients for a year after the patients lost access to primary care from a medical group practice in Los Angeles because their Medicaid coverage was discontinued. Compared to a control group of Medicaid clients who did not lose coverage, study patients displayed reduced use of outpatient services, deterioration in blood pressure control, and reductions in self-perceived general health status. Seven deaths occurred in the group that lost access to care, of which some were judged to have been preventable through use of services.

Fihn and Wicher (1988) made very similar observations when they followed a group of patients for 17 months after budget cuts led to loss of access to primary care services at an outpatient department of a Veterans Administration facility in Seattle, Washington. The study documented that, compared to a control group, the patients discharged from the clinic experienced deterioration in blood pressure control, reduced use of prescribed medicines, and a fall in self-perceived health status.

Shea, Misra, Ehrlich, et al. (1992) conducted a retrospective case control study of patients with uncontrolled hypertension admitted to a New York City hospital in a poor neighborhood. Multivariate analyses revealed that these patients were significantly more likely than controls to report that they had no primary care physician.

A last study of undifferentiated primary care took still another approach. Shi (1992) used ordinary least squares regression analysis to investigate the relationship between states' supply of office-based primary care physicians (general or family practitioners, internists, and pediatricians) and indicators of the health status of their populations. Health status indicators included infant mortality, life expectancy, the percentage of newborns weighing less than 2,500 grams, overall mortality rates, and mortality rates from heart disease, cancer, and stroke. Shi found that the supply of primary care physicians was positively and significantly associated with longer life expectancy, and negatively and significantly associated with death from cancer and heart disease. Primary care physician supply was negatively associated with neonatal mortality as well, but at a marginal level of statistical significance ($p < .10$). The supply of office-based practitioners of primary care is a relatively crude indicator of the availability and use of primary care in a geographic locality, and the use of states as the unit of analysis somewhat weakens the face validity of the results.

Studies of Undifferentiated Primary Care: Summary

Like the Shi study, many of the studies reviewed above have methodologic problems. For example, despite attempts to control for confounding variables, doubts persist about whether populations served by community-based primary care programs differ in important ways from comparison groups employed in the studies cited. Patients who choose to use CHCs may be more interested in their health, more motivated to seek health care, and more capable of coping with their socioeconomic circumstances than their neighbors. These personal characteristics would have important implications for patients' use of health care services and their health status levels, and would be hard to isolate.

Nevertheless, taken together, existing studies of undifferentiated primary care among vulnerable populations leave the strong impression that the use of primary care services is associated with favorable effects on the processes and outcomes of care. Existing studies leave largely unresolved, however, the question of whether primary care reduces the cost of health care services overall in such groups.

STUDIES OF SPECIFIC ATTRIBUTES OF PRIMARY CARE

Seeking better understanding of the efficacy of primary care, some studies have attempted to isolate the effects of delivering services with specific attributes of primary care. Unfortunately for the purposes of this review, relatively few of these studies focus directly on vulnerable populations.

First-Contact Care

Assessment of the efficacy of first-contact care is complicated by ambiguities concerning the meanings of the term. The literature defines it as care that is accessible and that thus forms the easiest and most natural point at which patients make contact with the health care system (Starfield 1992). Starfield believes that first-contact care should involve a gatekeeping or management function as well.

The efficacy of gatekeeping as an attribute of primary care remains to be demonstrated. Some studies suggest that reliance on gatekeepers reduces utilization of specialists' services and emergency room care. For example, Martin, Diehr, Price, et al. (1989) report the results of a controlled trial in which new enrollees of an independent practice association were randomly assigned either to gatekeeper physicians, who had financial incentives to reduce referrals and hospitalization, or to nongatekeeper physicians. Patients in the gatekeeper group had lower ambulatory care expenditures because of reduced use of specialty services. Hurley and his colleagues (Hurley, Freund, and Taylor 1989; Hurley, Paul, and Freund 1989; Hurley, Gage, and Freund 1991) reported similar findings in analyses of Medicaid demonstration programs in multiple states. These projects moved Medicaid patients out of the fee-for-service system and into various case management arrangements that relied on primary care gatekeepers.

Other studies, however, have not demonstrated effects on utilization (Moore, Martin, and Richardson 1983; Hurley, Gage, and Freund 1991). No studies have documented overall reductions in expenditures. Furthermore, no improvements in health care outcomes have been shown as a result of gatekeeping (Hurley, Gage, and Freund 1991; Carey, Weis, and Holmer 1991). The lack of evidence for the efficacy of this feature of first-contact care may result in part from the fact that few U.S. physicians, primary care or otherwise, have been specifically trained to perform this very complicated gatekeeper role (Starfield 1992; Eisenberg 1985).

Longitudinal Care

The supposed value of the longitudinal attribute of primary care derives from its ability to promote trust and communication between provider and patient. Longitudinality increases providers' and patients' familiarity with one another, the likelihood that patients will seek needed care, and the likelihood that physicians will recognize problems (Starfield, Simborg, Horn, et al. 1976).

In 1982, Dietrich and Marton critically reviewed the existing literature concerning the effects of "continuous care" on the results of health care. Their definition of "continuous care" was identical to Starfield's definition of longitudinality. Of the 29 studies they reviewed, they felt only 4 provided "definitive information" on the effects of longitudinal care. They concluded that "longitudinal care has proven advantages in some settings and for some patients" (Dietrich and Marton 1982, 936). The four definitive studies found evidence that longitudinal care increased satisfaction with care on the part of patients and staff (Becker, Drachman, and Kirscht 1974; Woolley, Kane, Hughes, and Wright 1978; Caplan and Sussman 1966); increased appointment compliance in low-income pediatric settings (Becker, Drachman, and Kirscht 1974); increased medication compliance during acute illness in pediatric populations (Becker, Drachman, and Kirscht 1974; Charney, Bynum, Eldredge, et al. 1967); and increased disclosure of behavioral problems by mothers of low-income pediatric patients (Becker, Drachman, and Kirscht 1974). Dietrich and Marton found no studies that addressed the effects of longitudinality on morbidity, mortality, or the use of preventive services.

Wasson and his colleagues (Wasson, Sauvigne, Mogielnicki, et al. 1984) designed a double-blind, prospective, randomized controlled trial of the effect of what they called the "continuity" of care on elderly men followed in the outpatient department of a Veterans Administration facility. Patients were randomly assigned to groups in which either they saw the same provider for each outpatient visit or they were sent to one of three providers based on the toss of a die. Patients were followed for 2.5 years after randomization. Since the defining characteristic of the intervention was uninterrupted care by a single provider over time, Wasson and his colleagues were testing the effects of longitudinal care as defined by Starfield. They found that patients in the continuous care group experienced significantly fewer outpatient laboratory tests, emergent hospitalizations, and ICU stays and had shorter hospital stays. Providers and patients in the continuous care group also showed higher satisfaction with care. No effect of continuity, however, was found on the use or outcome of specified preventive measures, the accuracy of medication lists in medical records, patients' perception of their access to or the quality of care, the numbers of unscheduled or missed visits, visit rates, or the functional status of patients.

In a 1992 review of the effect of longitudinality, Starfield divided the literature into two groups of studies: those examining longitudinal relationships between patients and facilities, and those studying relationships between patients and particular providers. The former group included a number of studies of undifferentiated primary care, so that the results could not always be attributed precisely to the influence of longitudinality. Like Dietrich and Marton (1982) and Wasson, Sauvigne, Mogielnicki, et al. (1984), Starfield concluded that longitudinality has significant benefits, including increased treatment of common conditions (otitis media and asthma), lower overall costs of care, increased treatment of preventable conditions, increased recognition of health problems, increased patient satisfaction, and reduced emergency room visits and hospitalizations.

One of the few negative studies on the benefits of longitudinality is that of Roos, Roos, Gilbert, et al. (1980). The researchers studied "continuity of care," defined as "the extent to which medical services are received as a succession of coordinated and uninterrupted events" (p. 174). Their measures of continuity placed heavy weight on the extent to which the patient used the same physician or facility over time. Thus, their study can be seen, like the one by Wasson and colleagues (Wasson, Sauvigne, Mogielnicki, et al. 1984) as measuring the effect of longitudinality. The investigators used Manitoba's provincewide database to study the effects of longitudinality on the quality of care among pediatric patients receiving tonsillectomies and adenoidectomies in Manitoba from 1972 to 1974. The indicator of quality was the extent to which children undergoing tonsillectomy and adenoidectomy met explicit indications for that procedure. No relationship was found between longitudinality and quality of care.

Comprehensiveness of Care

The value of comprehensiveness as an aspect of primary care has rarely, if ever, been studied in isolation. This is not surprising since, by its very nature, comprehensiveness implies the simultaneous availability of many aspects of care, and their delivery as a unified whole. The best data are, therefore, indirect.

One source of such information is found in the literature that suggests community health centers reduce utilization of expensive institutional services and improve health status (Okada and Wan 1980; Freeman, Kiecolt, and Allen 1982; Deprez, Pennel, and Libby 1987; O'Connor, Wagner, and Strogatz 1990; Zuvekas 1991). CHCs were explicitly designed to offer a full range of health care benefits, including many services that are nonmedical in nature (Sardell 1988; Patton 1990). Several studies have demonstrated CHCs' success in achieving this objective. Based on an analysis of routine reports to the federal government filed by 82 CHCs in 1972–73, Reynolds (1976) reported evidence that CHCs offer a comprehensive range of care. He found that most CHCs offered a "full range of basic ambulatory services" and that a large percentage offered such nontraditional care as home health services, mental health services, and social and community services.

Another indirect approach to assessing the value of comprehensiveness as an attribute of primary care is to examine the availability and efficacy of categories of services that are typically offered as part of a comprehensive package of primary care services, such as preventive care (Starfield 1992). Several studies (Gordis 1973; Deprez, Pennel, and Libby 1987; O'Connor, Wagner, and Strogatz 1990; Zuvekas 1991) suggest that CHCs and other sources of comprehensive primary care are more likely to offer a complete range of preventive services than are alternative sources of care. Authoritative groups have judged a number of preventive services to be effective in improving health status. Screening and therapy for hypertension in adults reduces morbidity and mortality from cerebrovascular disease (Eddy 1991; U.S. Preventive Services Task Force 1989; Russell 1986). Mammographic screening reduces mortality for women over 50 years of age (Eddy 1991). Screening for cervical cancer is efficacious (Fahs and Garibaldi 1991), and prenatal care has documented effectiveness in improving birth outcomes (Starfield, Egbuonu, et al. 1985; Starfield 1986). Similarly, the efficacy of immunization in the prevention of communicable disease is well established (Starfield, Egbuonu, et al. 1985; Starfield 1986).

Coordination

Coordination implies that the various aspects of a patient's care are integrated with one another over the course of an episode of contact with the health care system. Studies of the value of coordination per se are relatively rare. Of those that exist, most have focused on the utility of the medical record in improving the recognition of information from the first visit at subsequent visits, especially information about provider- and patient-identified problems (Liptak, Hulka, and Cassel 1977; Starfield and Scheff 1972).

Four studies have looked at the effective transfer of information from one visit to another. In the first, Starfield, Simborg, Horn, et al. (1976) showed that physicians were more likely to recognize problems they themselves noted at earlier visits than they were to follow up on information obtained by other providers during intervening visits. The same researchers then sought to improve recognition of information from other physicians by adding notes to the record. They found that a handwritten list of problems identified at a previous visit, when placed at the beginning of the medical record, improved physicians' follow-up rate on those problems, especially when six or more weeks had elapsed between visits (Simborg, Starfield, Horn, et al. 1976). This study did not, however, indicate who had identified the problems.

Elaborating on that work, Starfield and her colleagues (Starfield, Simborg, Johns, et al. 1977) found that computerized record summaries containing information about problems and current therapies improved physicians' recognition of the problems and therapies at subsequent visits, but only for care the physicians themselves provided. Physician recognition of problems added to the record by other providers during intervening visits was not improved. Based on this work, the authors hypothesized that practitioners might not be taking responsibility for all of a patient's care, assuming instead that other practitioners took responsibility for those problems. These studies did not evaluate whether or not physician recognition of a problem predicted any change in care or outcome. However, an earlier study (Starfield and Scheff 1972) showed that more complete record keeping is associated with better outcomes of care, as a result of improved recognition of problems.

While a small number of studies have measured coordination between multiple providers, none of these has related coordination to patient outcomes. Fletcher and his colleagues (Fletcher, O'Malley, Fletcher, et al. 1984) evaluated whether or not patients received coordinated care at a large teaching hospital. They defined coordinated care as care meeting two conditions: (1) there was written evidence that when a physician other than the patient's primary physician was involved in the patient's care, the second physician was aware of the primary physician's involvement; and (2) either the primary physician arranged the visit to the other physician or knew about it beforehand, or the primary physician learned of it after it had occurred. The researchers found that coordination was better when patients were seen in a walk-in clinic or when they were admitted to the hospital (care that was generally delivered by physicians in the same clinical department as their primary care physician) than when the patient was seen in other clinics (care that was generally delivered by physicians who were members of other departments).

McPhee, Lo, Saika, and Meltzer (1984) studied the exchange of information between primary care physicians and subspecialty consultants at a university medical center. The likelihood of there being coordination was enhanced by existing relationships between the physicians, including the existence of a special referral form that was filled out for all requests for consultations. Even under these circumstances, the flow of information between providers was spotty. Almost all (98 percent) of the referring physicians provided some clinical information about the patient on the request form. Just 77 percent indicated the reason for the referral, and 76 percent stated they wanted to learn the consultant's findings. In follow-up, 45 percent of those asking for results of the consultation reported they did not receive them. While, in most of these cases, feedback had been entered in the patient's record, the perception on the part of the primary care physician that no information had been forthcoming is indicative of lack of coordination.

Studies of Specific Attributes of Primary Care: Summary

The literature on specific attributes of primary care is less abundant than the literature on undifferentiated primary care, especially in vulnerable populations. Existing studies on the efficacy of two of these attributes–first-contact care and coordination–are either inconclusive or too few in number to permit any reliable conclusions to be drawn. However, the literatures on longitudinality and comprehensiveness are more complete and convincing. The provision of longitudinal care seems to be associated with several beneficial effects, including improved patient satisfaction, improved patient compliance with physicians' recommendations, improved problem recognition by providers, and reduced utilization of certain expensive services. The provision of comprehensive care is associated with greater availability of preventive services that are widely considered efficacious.

Gaps in the literature on the benefits of specific attributes of primary care indicate that much remains to be learned about the contribution of particular characteristics to the overall efficacy of primary care. There is also a pressing need for future studies to clarify terminology so that readers can identify precisely which aspect of primary care is actually under investigation. Finally, the efficacy of specific attributes of primary care for poor, uninsured, and minority patients needs to be better addressed.

CONCLUSIONS AND RECOMMENDATIONS

Given the importance of primary care and the critical role that it is likely to assume under health care reform, the literature specifically examining its effects on the processes and outcomes of care for vulnerable or other populations is relatively modest. However, the rationale for primary care is at least as strong as the rationale for many of the expensive acute care services that are routinely included in health insurance benefit packages that cover underserved populations (Mulley, Blumenthal, and Slavin 1992; Graversen, Gasser, Wasson, et al. 1989). It is remarkable that public authorities have never commissioned and funded a comprehensive scientific assessment of the consequences of making primary care available to the American public. Such an assessment could improve our understanding of the value of primary care services to advantaged and disadvantaged populations alike. However, much can still be learned from the existing literature about the effects of providing primary care to the underserved. The available studies on the efficacy of primary care in such groups support the following conclusions:

1. Community-based interventions that increase the availability of primary care to underserved populations have the effect of improving access to services, reducing the use of emergency room and hospital outpatient services, increasing the use of noninstitutional ambulatory care, and reducing the use of hospital care (Hochheiser, Woodward, and Charney 1971; Okada and Wan 1980; Freeman, Kiecolt, and Allen 1982; Fleming and Andersen 1986).
2. The delivery of primary care to underserved populations is associated with improved control over routine illnesses, such as strep throat and hypertension, that have serious consequences if untreated (Gordis 1973; Lurie, Ward, Shapiro, et al. 1984, 1986; Fihn and Wicher 1988).
3. The availability of primary care to vulnerable populations improves

patients' self-perceived health status (Lurie, Ward, Shapiro, et al. 1984, 1986; Fihn and Wicher 1988).

4. Community-based primary care programs for underserved populations are associated with lower rates of preventable hospitalizations and reduced rates of cardiovascular disease among targeted populations, as compared to controls (Deprez, Pennel, and Libby 1987; O'Connor, Wagner, and Strogatz 1990).
5. Longitudinal care, a critical component of primary care, is independently associated with improved patient satisfaction, reduced use of ancillary and laboratory tests, improved patient compliance with provider recommendations, reduced hospitalization rates, shorter lengths of stay, and improved recognition of patients' behavioral problems (Dietrich and Marton 1982; Wasson, Sauvigne, Mogielnicki, et al. 1982).
6. To the extent that it implies the delivery of preventive services, comprehensive care–a critical component of primary care–is independently associated with the provision of services that have proven efficacy in improving health status in underserved and general populations alike.

It should also be noted that the literature does *not* adequately address, or does *not* definitively support, the following conclusions:

1. Making primary care available reduces the cost of care for underserved populations that receive it.
2. The gatekeeping function of primary care, a critical component, independently improves the process or outcomes of care, or reduces its costs, in vulnerable groups.

The absence of definitive information on the cost effects of consuming primary care should serve as a caution to policymakers who are inclined to exaggerate claims concerning the cost-saving potential of primary care. A commitment to primary care should be made for its potential to improve the satisfaction and health status of the American public, not for its potential to save money. Based on the evidence presented above and on these general considerations, the authors feel that any minimum benefit package under national health care reform should include coverage of primary care services if, as we believe, Americans and their elected representatives desire access to first-contact care that is longitudinal, comprehensive, and coordinated.

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