
Curtailment of Well Child Services by a Local Health Department: Impact on Rural 2-Year-Olds

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Synopsis

The impact of changes in the delivery of well child health services by a rural health department on the reported health status, immunization status, and patterns of health care use is evaluated for poor children born in 1981, when well child clinic services were reduced. Using birth certificate records, all 1981 resident births were enumerated

for the case county in Maryland and for a demographically similar comparison county that had continued to operate health department well child clinics. Trained local interviewers tracked and interviewed mothers or guardians of the 1981 cohort.

Data were obtained on 567 of 589 eligible children, reflecting a 96 percent response rate. Children in each county were defined as poor if their mothers reported receiving AFDC (Aid to Families with Dependent Children), food stamps, or medical assistance or reported annual household incomes of below \$5,000. This poverty status indicator was significantly correlated with health department use in the comparison county.

Findings indicate that mothers of poor children in both counties were as likely as mothers of nonpoor children to assess their 2-year-old's health status as good, to identify a regular source of preventive care, and to report complete immunizations for their toddler. Although many private physicians in the case county appear to be seeing poor children in their offices, the distribution of study children among physicians was highly skewed. Out of 19 physicians or health facilities in the case county, one pediatrician was reported as the primary source of pediatric care for 52 percent of the 2-year-olds, one-third of whom were poor. In contrast, no one physician or facility was reported as providing pediatric care for more than 10 percent of 2-year-olds in the comparison county. Findings are discussed in light of these differences in physician supply and practice patterns.

HISTORICALLY, LOCAL HEALTH DEPARTMENTS have served as the primary source of preventive health services for low income, medically underserved populations. The role of the health department has been particularly important in rural areas where physician shortages, limited health facilities, and transportation problems compound barriers to health care faced by the poor (1-7). In 1981, under the Omnibus Reconciliation Act, administrative authority for allocating Federal

funds for health and social programs was shifted from Federal to State Governments under the block grant program. Accompanying the creation of block grants were general reductions in Federal funds for primary care programs, which helped subsidize local health department services (8). States were put in the position of making internal decisions regarding allocation of Federal monies for competing programs. At the local level, rising health care costs and reduction in public funds for

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maternal and child health programs prompted some health departments to consider restricting or eliminating direct health care services.

In 1981, a rural county health department in Maryland decided to curtail its well child services by discontinuing physical examinations and preventive health screening for children and by restricting its immunization programs. This decision was prompted by the health department's ability to provide direct preventive health care to only a fraction of the poor children in the county due to reductions in funding and by individual willingness on the part of private physicians to accept Medicaid children and poor children without insurance as private patients. Previously, these children had received all their preventive health care (physical examinations, growth and development screening, and immunizations) at health department clinics.

The health department continued its policy of providing preventive health care for clients enrolled in the Women, Infants, and Children (WIC) food supplement program. Although these clients would not receive physical examinations or physician health assessments, they would be offered immunizations, nutritional counseling, and a nursing assessment of their health needs. Immunization clinics for health department users formerly conducted on a weekly basis were reduced to a monthly schedule. Clients were encouraged to seek preventive health care services for their children in the local community. Thus, while not all well child services were discontinued by the health department, the closing of the general well child clinics and the reduction of the immunization programs represented a significant departure from the health

department's former policy of providing comprehensive well child health care for poor children.

In 1983, 2 years after the well child clinics closed, the Johns Hopkins School of Hygiene and Public Health, in collaboration with the local health department, undertook an evaluation of the impact of this policy change on the health of young children in its county. Several major questions were raised. What effect, if any, did the curtailment of preventive health services have on the overall health status of young children? What percent of poor families with young children have no regular source of preventive health care? Among those families who have a source of well child care, what proportion have experienced problems in locating and securing care? Did changes in the health department's immunization program affect the immunization status of poor young children? A community-based survey was designed to address these questions.

Methods

The target population for the study was all children who were born in the county in 1981, the year in which the health department's clinics were discontinued. Since the county lacked information about the health status, immunization status, and health care utilization patterns of their children prior to the clinics' closings, a before-and-after evaluation study was not possible. Instead, a list was developed of all rural counties in Maryland with health departments that provided immunizations, physical examinations, medical growth and development screening, and WIC food supplement programs.

From the list, a comparison county was selected based on its similarity to the case county on a variety of demographic characteristics. They were racial composition, median family income, percent of the population below the poverty level, size of the child population (0-18 years), the ratio of primary care physicians to total population, and the ratio of pediatricians or family practitioners to children under 5 years (table 1).

In September 1983, a complete listing of all children born in 1981 in each county was obtained by a review of birth certificates of residents. Birth certificate records were compared with death certificate records from January 1981 to August 1983 to exclude deceased children from the lists. Information on the child's race, sex, and birth weight and the mother's name and address was abstracted from the birth certificate.

Table 1. Selected demographic and economic indicators, case and comparison counties, 1980

Indicators	Case county (N = 322)	Comparison county (N = 242)
Number of children under 18 years ¹	7,860	7,881
Percent of the population, black ²	29.7	26.6
Percent of persons with income less than 100 percent of poverty level ³	14.5	14.3
Percent of families with incomes less than 125 percent of poverty level with related children less than 18 years old ⁴	27.4	20.6
Median family income (dollars) ⁵	16,700	16,600
Primary care physician to population ratio ⁶	1:255	1:343
Pediatrician or family practitioner to child population under 5 years (ratio) ⁷	1:152	1:121
Federal Index of Medical Underservice score ⁸	69.6	69.6

¹ U.S. Census Bureau, final population counts, 1980 census.

² U.S. Census Bureau, summary tape, file 3, table 44.

³ U.S. Census Bureau, summary tape, file 3, table 63.

⁴ U.S. Census Bureau, summary tape, file 3, table 59.

⁵ U.S. Census Bureau, summary tape, file 3, table 74.

⁶ Primary care physicians include internists, general-family practitioners, pediatricians, and obstetricians/gynecologists. The 1979 Maryland Medical Association data applied to 1980 population counts.

⁷ Data on the number of pediatricians and family practitioners, which were supplied by health departments, were applied to 1980 population counts.

⁸ The higher the score (maximum = 100), the relatively better off the county. The score is the weighted average of each county's percentage of poor families, percentage of elderly, the infant mortality rate, and the primary case physician to population ratio.

From October 1983 to January 1984, trained local interviewers from each of the two counties tracked and attempted to interview the mothers of 589 eligible children. A total of 567 respondents were finally interviewed either by telephone or in person. Families no longer living in the study counties were not interviewed. The final sample represents 96 percent of the eligible children in the two counties and essentially enumerates the entire target population. The counties did not differ significantly in their response rates. Of the completed interviews, 413 (73 percent) were conducted by telephone, and 154 (27 percent) were conducted in the mother's home. The counties did not differ in their percentages of telephone or in-home interviews.

The 20-minute interview covered questions about the 2-year-old's overall health, recent illnesses, chronic illness, use of well child care and episodic illness health services, problems the mother experienced in securing or paying for health care, and the child's current immunization status.

Results

Descriptive characteristics of the sample. Because curtailment of the health department's well child services might be anticipated to have its greatest impact on poor children, a measure of poverty status was used to compare the health and health care experiences of children in each county. Children were defined as poor if their mothers reported receiving AFDC (Aid to Families with Dependent Children), food stamps, or medical assistance or if they reported annual household incomes of below \$5,000. This poverty indicator was significantly correlated with health department use in the comparison county. Approximately 90 percent of the comparison county children classified as poor were either current or former users of the health department for immunizations and well child checkups.

Table 2 presents selected sociodemographic characteristics of the study children and their mothers. Mothers of poor children were more likely than the nonpoor to be unmarried, young, and lacking a high school education. Poor children were disproportionately represented among minority groups. Additionally, poor children were more likely than other children to have moved at least once since birth.

Mother's assessments of health status. Two-year-olds in both counties appeared to be in relatively good health by mothers' reports (table 3). In addition, poor and nonpoor mothers tended to evaluate the development of their children similarly.

Use of well child health services. Use of health services for well child care differed in the case and comparison counties (table 4). Pediatricians were the overwhelming choice for 2-year-olds in the case county, regardless of their poverty status. In contrast, poor children in the comparison county were more likely than children who were not poor to receive their physical examinations and immunizations from the health department. Only one family in each county was unable to identify a regular source of well child health care.

Approximately 30 percent of the poor in each county paid for the preventive pediatric care out-of-pocket, compared with about 80 percent of the nonpoor. The percentage of poor having Government medical insurance was similar in both counties, suggesting that private pediatricians in the case county who saw poor children in their

Table 2. Selected sociodemographic characteristics of study mothers and their 2-year-olds by poverty status and county (percentages)

Characteristics	Case county		Comparison county	
	Poor (N = 101)	Nonpoor (N = 221)	Poor (N = 75)	Nonpoor (N = 167)
<i>Mother</i>				
Marital status:				
Married.....	16	181	19	184
Ever married.....	19	8	17	7
Never married.....	65	11	64	9
Education:				
Less than high school graduate.....	56	19	31	111
High school graduate.....	39	59	61	46
More than high school graduate.....	5	32	8	43
Age:				
16–20 years.....	43	19	43	14
21–24 years.....	25	16	23	18
25–29 years.....	19	28	16	27
30 years or older.....	13	47	18	51
<i>Child</i>				
Race:				
White.....	25	179	20	183
Nonwhite.....	75	21	80	14
Sex:				
Male.....	54	54	60	52
Female.....	46	46	40	48
Birth weight:				
Less than 2,500 grams.....	10	8	13	6
More than 2,500 grams.....	90	92	87	94
Number of moves since birth:				
0.....	49	174	63	270
1.....	23	17	13	21
2.....	17	4	14	4
3.....	11	5	10	5

¹X² value $P < .001$. ²X² value $P < .05$.

Table 3. Mothers' assessments of their 2-year-olds by poverty status and by county (percentages)

Indicators	Case county		Comparison county	
	Poor (N = 101)	Nonpoor (N = 221)	Poor (N = 75)	Nonpoor (N = 167)
Overall health:				
Excellent.....	57	68	50	72
Good.....	35	27	43	26
Fair/poor.....	8	5	7	12
Physical growth compared with other children the same age:				
Faster growth.....	27	27	30	32
About the same.....	67	71	66	65
Slower growth.....	6	2	4	3
Development compared with other children the same age:				
Faster development.....	45	49	35	44
About the same.....	50	47	57	55
Slower development.....	5	4	8	11
Illness in past 2 weeks:				
No illness.....	89	87	91	88
One of more illnesses.....	11	13	9	12
Chronic illness:				
None.....	84	91	90	88
One or more illnesses.....	16	9	10	12

¹X² value $P < .05$.

county, since one out of six cells has expected cell frequency less than 5.

NOTE: Significance tests should be interpreted with care for comparison

Table 4. Use of health services by 2-year-olds according to their mothers by poverty status (percentages)

Indicators	Case county		Comparison county	
	Poor (N = 101)	Nonpoor (N = 221)	Poor (N = 75)	Nonpoor (N = 167)
Well child care most frequently used:				
General practitioner-family practitioner	2	4	3	¹ 20
Pediatrician	96	93	5	48
Group practice	0	0	8	6.5
Health department	2	2.5	84	25
No source	0	0.5	0	0.5
Method of payment:				
Own resources	31	¹ 77	30	¹ 80
Private insurance (for example, Blue Cross) . .	0	19	3	20
Government insurance (for example, Medic- aid)	69	4	67	0
Number of hospitalizations since birth:				
0 times	48	² 65	83	87
1 time	24	29	15	10
2 or more times	28	9	2	3
Changed providers in the past year:				
Yes	9	² 3	12	14
No	91	97	88	86
Problems in getting care:				
Yes	13	9	15	17
No	87	91	85	83

¹ X² value P < .05. ² X² value P < .001.

offices were accepting Medicaid reimbursement. Approximately 11 percent of the children in the case county continued to use the health department clinics for immunizations. Of this group, the majority were enrolled in the WIC food supplement program. Although the percentage of children in the case county whose mothers reported changing health care providers was small, poor children were three times more likely to have made a change than children who were not poor.

The percentage of mothers in the case and comparison counties who reported problems in securing health care services did not vary by poverty status. Problems included cost of care, transportation, hours when services were available, and scheduling appointments.

Poor children in the case county were significantly more likely to have been hospitalized than children who were not poor. A similar difference in hospitalization experiences was not observed in the comparison county. However, since there was no hospital in the comparison county, the absence of differences may have been a function of access to a hospital facility.

Mothers were asked to name the physician or facility where they took the child for illness related health services. Table 5 lists these health care sources and the percentage of children seen at each who were poor. In the case county, the majority

of the mothers used a pediatrician for acute care, and these percentages did not vary significantly by poverty status.

The distribution of study children among private physicians varied considerably between case and comparison counties. At the time of the survey, one physician in the case county was named as the primary source of pediatric care by 52 percent of the mothers in the case county, one-third of whom were poor. In the comparison county, however, no single physician or health facility served more than 10 percent of the study children.

Immunization status. Perhaps the most pertinent issue for the case county was the immunization status of its 2-year-olds. Although the health department provided immunizations for a portion of its health department clients, the question remained, "Would changes in service delivery affect the completeness of immunizations, particularly for poor children?" To obtain complete immunization information, mothers were asked a series of questions about each injection. If they had an immunization record at home, they were asked to use the record when reporting the child's history.

As seen in table 6, the most frequent response given by mothers about immunization completeness for diphtheria-pertussis-tetanus (DPT) and po-

liomyelitis was "up-to-date." This response was volunteered by the mothers and was not offered by the interviewers as a legitimate response category. Mothers stated that although they did not know the exact immunization history (which was kept in the physician's office) they were certain that the child had all appropriate immunizations.

Although mothers of poor children in both case and comparison counties were somewhat less likely to report complete immunization with the numbers of injections or doses (that is, three to four injections, DPT vaccine; three to four doses, poliomyelitis vaccine; or one injection, measles, mumps, and rubella vaccine), the distribution of

Table 5. Sources of sick care and percentages of 2-year-olds who are poor, case and comparison counties

Source	Comparison county (N = 242)		Source	Case county (N = 322)	
	Percent of sample using source	Percent of users who are poor		Percent of sample using source	Percent of users who are poor
Physician 1	9.5	0	Physician 1	51.6	33
Physician 2	9.5	61	Physician 2	18.9	41
Physician 3	9.1	18	Physician 3	13.4	33
Facility 1	8.7	67	Physician 4	6.2	5
Physician 4	7.0	12	Physician 5	1.6	20
Physician 5	6.6	6	Physician 6	1.6	20
Physician 6	5.8	36	Physician 7	1.6	40
Physician 7	5.4	39	Physician 8	1.2	25
Physician 8	5.0	42	Physician 9	0.9	33
Facility 2	4.1	40	Others ²	3.1	...
Facility 3	3.7	22			
Facility 4	3.7	56			
Physician 9	2.9	0			
Physician 10	2.9	57			
Physician 11	2.5	0			
Physician 12	2.1	0			
Others ¹	11.6	...			

¹ Represents 13 physicians or facilities each seeing less than 2 percent of the study children.

² Represents 10 physicians or facilities each seeing less than 0.6 percent of the study children.

Table 6. Immunization status of 2-year-olds by poverty status for case and comparison counties (percent)

Immunizations	Case county		Comparison county	
	Poor (N = 101)	Nonpoor (N = 221)	Poor (N = 75)	Nonpoor (N = 167)
Diphtheria, pertussis, tetanus (DPT):				
0-2 injections	3	2	9	6
3-4 injections	30	45	39	42
Up-to-date	54	45	40	45
Don't know	13	8	12	7
Poliomyelitis:				
0-2 doses	5	5	21	110
3-4 doses	28	40	25	36
Up-to-date	50	45	39	45
Don't know	17	10	14	8
Measles, mumps, rubella (MMR):				
No injection	5	3	13	12
1 injection	30	43	45	49
Up-to-date	46	43	28	30
Don't know	19	11	13	8
Record used	23	23	34	35
No record used	77	77	66	65
Complete immunization ²	92	93	70	81
Incomplete immunization ³	8	7	30	19

¹ χ^2 value $P < .05$.

² 3-4 injections or up-to-date for DPT; 3-4 doses or up-to-date for poliomyelitis; 2 injections or up-to-date for MMR.

³ 0-2 injections or don't know for DPT; 0-2 doses or don't know for poliomyelitis; 0 injection or don't know for MMR.

responses to immunization questions did not vary significantly by poverty status in the case county. In the comparison county, the mothers of poor children were twice as likely as other mothers to report two or fewer doses of poliomyelitis vaccine. Although mothers of poor children in the case county were somewhat more likely to report "don't know" than other mothers, these differences were not statistically significant.

Approximately 90 percent of poor and nonpoor case county children were defined as having had a complete immunization series, as compared with 70-81 percent of the 2-year-olds in the comparison county. Children were considered to have a complete immunization series if their mothers reported them as having had three to four injections of DPT vaccine; three to four doses of poliomyelitis vaccine; one injection of measles, mumps and rubella vaccine; or "up-to-date" for any or all of the three immunizations. These results raise the question of why children in a county with active well child clinics should have a poorer immunization record than children in a county with limited health department services.

To investigate this question, comparisons were made between children whose mothers reported their immunization histories using a record and those whose mothers recalled immunizations from memory. Approximately 34 percent of the mothers in the comparison county used a record when reporting immunizations, compared with 23 percent in the case county (table 6). Overall, when mothers reported immunization histories from records, they were somewhat more likely to report incomplete immunizations than when they recalled the immunization information from memory. Poor mothers in both counties were as likely as nonpoor mothers to report immunizations from a record. Thus, while variations in immunization histories observed for poor and nonpoor children within each county cannot be attributed to reporting differences, the method by which the information was obtained may account for some of the differences in immunization observed between counties.

Discussion

Findings from this study suggest more similarities than differences between poor children who live in a county with restricted health department well child services and poor children who live in a county with physical examinations and immunization programs sponsored by the health department.

Overall, mothers' reports of their toddlers' health and immunization status were similar for the case and comparison counties. Several possible explanations can be offered.

First, private physicians in the case county appear to be seeing former health department users in their offices for pediatric care. Although this tends to confirm the original agreement made by the health department with the medical community, the distribution of study children across private physicians does suggest potential problems in the future for the supply of health care services. Of 19 physicians or facilities in the case county, 1 pediatrician was named as the primary care source by 52 percent of the study mothers, one-third of whom were poor. This physician was well known in the community for his flexible hours and his willingness to see patients in need of care regardless of their ability to pay for services. Any change in that physician's practice patterns or policy regarding poor clients would affect the availability of preventive health care for children. In the comparison county, no single physician or health facility served more than 10 percent of the children. These distributional differences suggest that the case county children may be more vulnerable than children in the comparison county to fluctuations in physician supply.

Second, it is possible that the consequences of the health department's policy have yet to be fully realized. Two years may be too brief a period for an effect to be observed. For example, the poor may not have had the opportunity to accumulate sufficiently large unpaid medical bills that could result in denial of health care services. The cross-sectional nature of our data limits evaluation to a single point in time, and the data do not permit any projections of future consequences of curtailment of health department services on the health care needs of children.

Third, questions in this survey address sources of pediatric care, utilization patterns, cost, transportation, and scheduling problems in gaining access to pediatric health care services. We did not measure delays in seeking care that may result from changes in the health department's policy to deliver direct health care services. Since preventive health care visits tend to be more discretionary than illness visits and are less likely to be covered by insurance, poor families may delay well child checkups.

Fourth, the case county did not discontinue all of its well child health services. Immunizations and nursing health assessments were routinely provided

for children in the WIC food supplement program. Additionally, immunizations were offered to users of the general health department on a limited basis. It should be noted, however, that despite the health department's continuation of its immunization program, only 11 percent of mothers in the case county reported using the health department for immunization of their 2-year-olds at the time of the survey. Thus, it appears that few study families in the case county split preventive health care services between private physicians for physical examinations and well child screening and the health department for immunizations.

Finally, the immunization status of 2-year-olds in the case county appears to be complete if "up-to-date" is considered a valid response. Health department staff and local interviewers were not particularly surprised by the percentages of mothers who reported an up-to-date immunization status, as they felt it was common to rely on the physician's records rather than to keep individual immunization records at home. To verify immunization completeness, future studies might include a medical record review on a sample of children. Because this was an unexpected finding, provision had not been made to secure permission from the mother to contact the physician and review the child's medical record. Although self-reported information may yield an overestimate of immunization completeness, it is important to recall that responses to immunization items did not vary significantly by poverty status for children in the case county. If immunizations are actually less complete than as reported by mothers, nonpoor children are as likely to be missing information as are poor children.

It was anticipated by many State and local health department personnel that curtailment of health department well child services would increase the numbers of poor families without a regular source of preventive care and might result in greater numbers of children who were not completely immunized. Our data show that in this rural county practically all families were able to identify sources of preventive as well as episodic illness care and that reductions in health department immunization programs did not appear to affect the reported immunization status of toddlers.

This study is an attempt to evaluate the implications of reductions in Federal funding for categorical programs for local health departments. Findings are limited by the cross-sectional nature of the data and by reliance on mothers' reports of

the children's health and immunization status. Nonetheless, by providing a complete enumeration of the target population in the two counties, it was possible to assess the effects of policy changes on health care of poor and nonpoor children. Caution should be exercised, however, in generalizing these findings to other rural areas. Although rural communities share many common characteristics, such as relatively high proportion of people living at or below the poverty line, they differ both in the supply and the distribution of health care providers. They may also differ in working arrangements between the private and public health sectors. This possibility appears to be a particularly important aspect in any decisions to reduce health department services.

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