Dental Decay Rates Among Children of Migrant Workers in Yakima, WA

MARK KODAY, DDS
DAVID I. ROSENSTEIN, DMD, MPH
GLORIANA M. NANA LOPEZ, DDS, MPH

Dr. Koday is Dental Director, Yakima Valley Farm Workers Clinic, Toppenish, WA; Dr. Rosenstein is Professor and Chairman, Department of Public Health Dentistry, Oregon Health Sciences University, Portland, OR; and Dr. Lopez is Chief Dental Officer, Division of Primary Care Services, Bureau of Health Care Delivery and Assistance, Rockville, MD.

Tearsheet requests to Dr. Rosenstein, 611 SW Campus Dr., SD206, Portland, OR 97201-3097.

Synopsis

The literature documents a significant decline in the prevalence of dental caries among children. Unfortunately, dental decay rates of children of migrant workers remain high.

This study collected data from 885 migrant children in central Washington. This community is in the west coast migrant stream. The area is served by a health center funded through the community and migrant health center program. There is an active dental program provided through the health center.

The children were found to have a high rate of dental decay. However, there was a high rate of treatment of this decay and a rate of sealants (a preventive measure) nearly three times the rate in the general population. Although dental decay remains a serious problem in the migrant community, the migrant health centers appear to be making a positive impact on the dental health of the children.

The dental literature is replete with references documenting a significant decline in the prevalence of dental caries over the last 25 years (*1–5*). Concurrent with the documentation of this decline in children are reports that the decline is not uniform and that a significant number of children are still at risk for dental caries (*6, 7*).

The reports just cited suggesting that a group of children are suffering disproportionately from dental caries are certainly not new. The differential caries experience of black and white children has been noted for many years (*1, 2*), but it has not been confirmed in the recent surveys (*3, 8*). The vulnerability of migrant children has been noted by several researchers—Avery (*9, 10*), Bachand (*11*), Cipes (*12*), Ismail (*13*), Ragno (*14*), Call (*15*), and Woolfolk (*7*).

The reports published to date regarding caries prevalence in migrant children describe the caries experience among children in the mid-continent and east coast migratory streams. These streams originate in Texas and Florida and spread through the Midwest, Southwest, and east coast. The dental caries experience in children from the west coast stream has not been reported. It was expected that the decay rates among migrant children in the west coast stream would be similar to those of other migrant children. The west coast stream originates in Texas and the Southwest. Some workers travel only within a single State, but others travel from Texas to the Pacific Northwest and back (*16*).

This study of migrant children in a three-county area of central and eastern Washington was conducted to determine dental caries experience among this population and the extent of care that has been provided.

Methods

Data were collected on 885 children in the 1988 summer school program for migrant children in the Yakima Valley of central Washington. Four schools geographically distributed to represent the upper, middle, and lower sectors of the valley were arbitrarily chosen for the survey. There were 335 students ages 6–12 enrolled in those four schools, and 216 of them, or 64 percent, were surveyed. The students without a signed permission slip were excluded. All the children surveyed were Hispanic and classified by the school system as migrant. The school follows the Federal standard used nationwide to include those children whose parents have moved across school district lines for agricultural or fishing purposes during the past year. This includes interstate and intrastate moves. A community and migrant health center has existed in the area since 1971. This health center has a dental program with five den-

Mean decayed and filled surfaces (dfs) scores for primary dentition and mean decayed, missing, and filled surfaces (DMFS) scores for permanent dentition among 216 Hispanic migrant summer school children in Yakima, WA

Age	Number of children	Mean scores: dfs or DS	Mean scores: fs or FS	MS	Percent ds ÷ dfs or DS ÷ DMFS	Mean dfs or DMFS
			dfs scores by age			
6 years	15	3.30	3.33	...	50	6.63
7 years	50	3.94	5.40	...	42	9.24
8 years	44	3.05	6.70	...	31	9.75
9 years	43	3.09	5.26	...	37	8.35
10 years	31	1.55	4.90	...	28	5.45
11 years	22	1.00	3.23	...	24	4.23
12 years	11	...	...	...	...	...
			DMFS scores by age			
6 years	15	0.33	0	0	100	0.33
7 years	50	0.56	0.38	0.10	54	1.04
8 years	44	1.20	0.45	0	72	1.66
9 years	43	0.86	1.40	0	38	2.26
10 years	31	1.39	1.13	0	55	2.52
11 years	22	1.73	2.41	0	42	4.14
12 years	11	2.64	1.64	0	62	4.27

NOTE: The dfs would be expected to decrease at age 10 as primary teeth are exfoliated.

tists who provide direct patient care and organize a community prevention program.

Examinations were conducted by a dentist who used methods described by the World Health Organization (*17*) and the diagnostic criteria for the dfs and DMFS scoring used in the North Carolina Oral Health Survey (*18*). The dfs score represents the total number of decayed (d) and filled (f) surfaces (s) of primary dentition that can be clinically detected in an oral examination. The DMFS represents decayed (D), missing (M), and filled (F) surfaces (S) of permanent dentition that can be clinically detected in an oral examination. These scores represent the amount of dental disease that has occurred in the past (filled and missing component) and active disease present (decayed component) that exist in the person or group surveyed. The presence of adhesive sealants in the posterior teeth was also recorded as an indicator of the exposure to prevention-oriented dental care.

Examinations were conducted at the schools. The examiner was calibrated before the study, and 10 percent of the examinations were duplicated with an agreement rate of better than 97 percent. Equipment included a No. 23 dental explorer, dental exam mirror, portable dental chair, and Hu-Friedy portable light source.

Results

The mean age-adjusted dfs score for this population of migrant children was 7.66, with the ratio of decayed surfaces to decayed and filled surfaces (percent d ÷ dfs) of 36 percent. The mean DMFS was 2.05, with a decayed surface to decayed, missing, and filled surface ratio (percent D ÷ DMFS) of 53 percent, indicating a high percentage of untreated decay. The dfs and DMFS are substantially higher than the 1986–87 ratios for school children reported by the National Institute of Dental Research (NIDR) (*8*).

The table shows the children's dfs, DMFS, percent d ÷ dfs, and percent D ÷ DMFS by age. Figures 1 and 2 compare this population with the NIDR data for 1986–87. There is a marked difference between migrant children and children in the general population.

The migrant children had a more uniform distribution of decay than the general population. The 1986–87 NIDR study showed that a minority of children have the majority of tooth decay, while a large percentage of children were decay free. Only 37 percent of the migrant population had dfs scores of 5 or less, and only 14 percent of these children were decay free in both their primary and permanent dentition.

Of this population, 19 percent had sealants in at least one tooth. NIDR data for 1986–87 show a 7.6 percent rate for the presence of at least one tooth with a sealant (*19*).

Discussion

This and previous studies show a disproportionate prevalence of dental caries among migrant children. In this study, the decay rates were approximately twice that of the general population. We were not able to determine the exposure of these children to the benefits of fluoride since this population is mobile. However, the differential appears too high for fluoride exposure to explain the entire difference in decay rates.

Mean decayed and filled surfaces (dfs) scores for primary dentition and mean decayed, missing, and filled surfaces (DMFS) scores for permanent dentition among 216 Hispanic migrant summer school children in Yakima, WA

Age	Number of children	Mean scores: dfs or DS	Mean scores: fs or FS	MS	Percent ds ÷ dfs or DS ÷ DMFS	Mean dfs or DMFS
			dfs scores by age			
6 years	15	3.30	3.33	...	50	6.63
7 years	50	3.94	5.40	...	42	9.24
8 years	44	3.05	6.70	...	31	9.75
9 years	43	3.09	5.26	...	37	8.35
10 years	31	1.55	4.90	...	28	5.45
11 years	22	1.00	3.23	...	24	4.23
12 years	11	...	...	...	...	...
			DMFS scores by age			
6 years	15	0.33	0	0	100	0.33
7 years	50	0.56	0.38	0.10	54	1.04
8 years	44	1.20	0.45	0	72	1.66
9 years	43	0.86	1.40	0	38	2.26
10 years	31	1.39	1.13	0	55	2.52
11 years	22	1.73	2.41	0	42	4.14
12 years	11	2.64	1.64	0	62	4.27

NOTE: The dfs would be expected to decrease at age 10 as primary teeth are exfoliated.

tists who provide direct patient care and organize a community prevention program.

Examinations were conducted by a dentist who used methods described by the World Health Organization (*17*) and the diagnostic criteria for the dfs and DMFS scoring used in the North Carolina Oral Health Survey (*18*). The dfs score represents the total number of decayed (d) and filled (f) surfaces (s) of primary dentition that can be clinically detected in an oral examination. The DMFS represents decayed (D), missing (M), and filled (F) surfaces (S) of permanent dentition that can be clinically detected in an oral examination. These scores represent the amount of dental disease that has occurred in the past (filled and missing component) and active disease present (decayed component) that exist in the person or group surveyed. The presence of adhesive sealants in the posterior teeth was also recorded as an indicator of the exposure to prevention-oriented dental care.

Examinations were conducted at the schools. The examiner was calibrated before the study, and 10 percent of the examinations were duplicated with an agreement rate of better than 97 percent. Equipment included a No. 23 dental explorer, dental exam mirror, portable dental chair, and Hu-Friedy portable light source.

Results

The mean age-adjusted dfs score for this population of migrant children was 7.66, with the ratio of decayed surfaces to decayed and filled surfaces (percent d ÷ dfs) of 36 percent. The mean DMFS was 2.05, with a decayed surface to decayed, missing, and filled surface ratio (percent D ÷ DMFS) of 53 percent, indicating a high percentage of untreated decay. The dfs and DMFS are substantially higher than the 1986–87 ratios for school children reported by the National Institute of Dental Research (NIDR) (*8*).

The table shows the children's dfs, DMFS, percent d ÷ dfs, and percent D ÷ DMFS by age. Figures 1 and 2 compare this population with the NIDR data for 1986–87. There is a marked difference between migrant children and children in the general population.

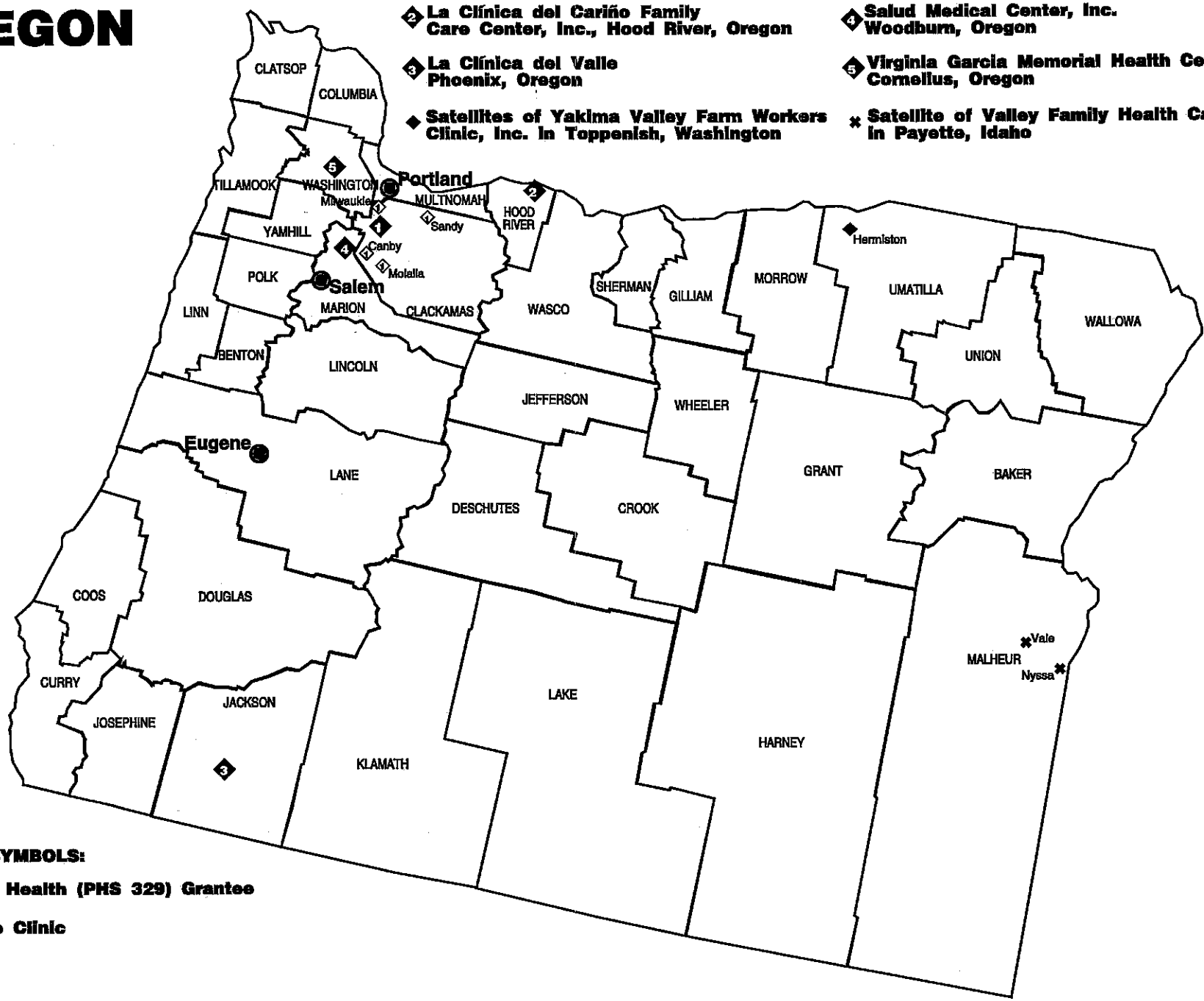
The migrant children had a more uniform distribution of decay than the general population. The 1986–87 NIDR study showed that a minority of children have the majority of tooth decay, while a large percentage of children were decay free. Only 37 percent of the migrant population had dfs scores of 5 or less, and only 14 percent of these children were decay free in both their primary and permanent dentition.

Of this population, 19 percent had sealants in at least one tooth. NIDR data for 1986–87 show a 7.6 percent rate for the presence of at least one tooth with a sealant (*19*).

Discussion

This and previous studies show a disproportionate prevalence of dental caries among migrant children. In this study, the decay rates were approximately twice that of the general population. We were not able to determine the exposure of these children to the benefits of fluoride since this population is mobile. However, the differential appears too high for fluoride exposure to explain the entire difference in decay rates.

OREGON



1. Clackamas County Public Health Division Oregon City, Oregon
2. La Clínica del Cariño Family Care Center, Inc., Hood River, Oregon
3. La Clínica del Valle Phoenix, Oregon
4. Salud Medical Center, Inc. Woodburn, Oregon
5. Virginia Garcia Memorial Health Center Cornelius, Oregon

◆ Satellites of Yakima Valley Farm Workers Clinic, Inc. in Toppenish, Washington

✖ Satellite of Valley Family Health Care in Payette, Idaho

KEY TO SYMBOLS:

◆ Migrant Health (PHS 329) Grantee

◇ Satellite Clinic

Figure 1. Decayed (d) and filled (f) deciduous surfaces (s) among children of migrant workers in Yakima, WA, 1988, compared with 1986–87 National Institute of Dental Research (NIDR) school children's survey

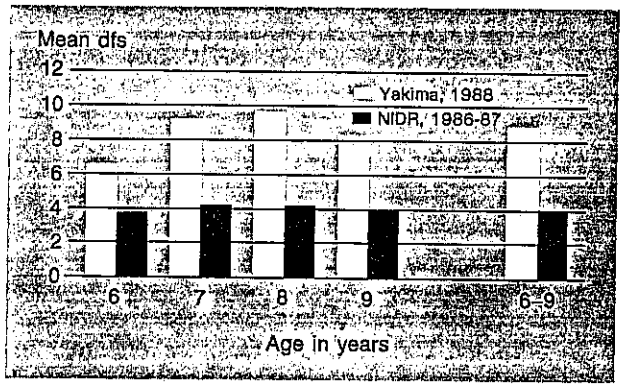
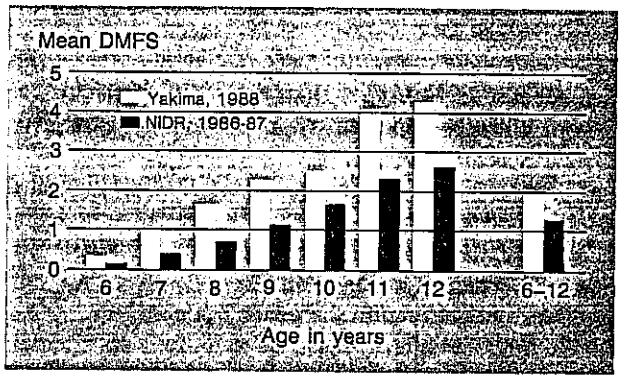


Figure 2. Decayed (D), missing (M), and filled (F) surfaces (S) among children of migrant workers in Yakima, WA, 1988, compared with 1986–87 National Institute of Dental Research (NIDR) school children's survey



There are two striking findings in this study. All previous studies showed a high prevalence of dental caries among migrant children. This study shows a high prevalence of dental caries, but a number filled that until age 10 approximates the general population's. This finding is probably attributable to the presence of a Migrant Health Center in the Yakima Valley, staffed with dentists supported from both Migrant Health Center funds and from the National Health Service Corps.

The other finding is the uniformity of decay among these children. Whereas other researchers report both a large percentage of children who are decay free (*3*) and a minority of children who have the majority of dental caries (*6*), in this population, a smaller percentage of children are decay free, and most children have some disease.

The percentage of U.S. children with at least one tooth with a sealant is 7.6 percent (*19*). This population of migrants had a rate nearly three times the national average. This rate of sealants demonstrates the effectiveness of an active migrant health center program.

Trends

Conclusions cannot be drawn from this limited study; however, trends are apparent. Although dental decay has shown dramatic declines in recent years, it is still a major problem for migrant children.

The Migrant Health Center in Yakima appears to have made a positive impact on the dental health of the children. The decay present is being treated and susceptible surfaces are being sealed. The problem is still significant, and it will need continued attention as well as new approaches.

Without more resources and preventive services, it is unlikely that this population, which already suffers from disproportionate rates of tuberculosis, hepatitis, and pesticide poisoning, will ever experience the gains in oral health status that the rest of the population enjoys. Some preventive services are being provided, as is evidenced by the use of sealants. But it is clear from the extent of decay that primary prevention is difficult to provide to this mobile population.

References

1. Public Health Service: Decayed, missing, and filled teeth among children. United States, 1963-65. Vital Health Stat [11] No. 106, HEW Publication No. (HRA) 74–1003. National Center for Health Statistics, Rockville, MD, 1971.
2. Public Health Service: Decayed, missing, and filled teeth among youths 12–17 years: United States. Vital Health Stat [11] No. 144, HEW Publication No. (HRA) 75–1626. National Center for Health Statistics, Rockville, MD, 1974.
3. National Institute of Dental Research, National Caries Program: The prevalence of dental caries in United States children, 1979–1980. NIH Publication No. 82–2245, Bethesda, MD, 1981.
4. Hicks, M. J., Flartz, C. M., and Silverstone, L. M.: The current status of dental caries in the pediatric population. J Pedodont 10: 57–62 (1985).
5. Editorial Committee of the International Association of Dentistry for Children: Dental caries: disease in decline. NY J Dent 56: 8–12 (1986).
6. Robert Wood Johnson Foundation special report: Preventing tooth decay: results from a four year national study. No. 2, Princeton, NJ, 1983.
7. Woolfolk, M. W., Hamand, M., Bagramian, R. A., and Sgan-Cohen, H.: Oral health of children of migrant farm workers in northwest Michigan. J Public Health Dent 44: 101–105 (1984).
8. National Institute of Dental Research, National Caries Program: Dental caries in United States school children, 1986–1987. NIH Publication No. 89–2247 (1989).
9. Avery, K. T.: Dental health of migrant agricultural workers. J Occup Med 16: 606–607 (1974).
10. Avery, K. T.: The oral health status of migrant and seasonal farm workers and their families in Florida. Community Dent Oral Epidemiol 4: 19–21 (1976).
11. Bachand, R. G., Gangarosa, L. P., and Bagassa, C.: A study of dental needs, DMF, def, and tooth eruption in migrant negro children. J Dent Child 38: 399–403 (1971).
12. Cipes, M., and Castaldi, C. R.: Dental health of children of migrant workers in Hartford, Connecticut. J Conn State Dent Assoc 56: 59–62 (1982).

13. Ismail, A. L., Burt, B. A., and Brunelle, J. A.: Prevalence of dental caries and periodontal disease in Mexican American children aged 5–17 years: results from the southwestern HHANES, 1982–83. Am J Public Health 77: 967–970 (1987).
14. Ragno, J., and Castaldi, C. R.: Dental health in a group of migrant children in Connecticut. J Conn State Dent Assoc 56: 15–21 (1982).
15. Call, R. L., Entwisle, B., and Swanson, T.: Dental caries in permanent teeth in children of migrant farm workers. Am J Public Health 77: 1002–1003 (1987).
16. Johnston, H. L.: Healthy for the nation's harvesters. National Migrant Workers Council, Inc., Farmington Hills, MN, 1985.
17. Oral health surveys – basic methods. Ed. 3. World Health Organization, Geneva, 1987.
18. Procedures and training manual for North Carolina Oral Health Survey 1986–87. Dental Health Section, Division of Health Services, North Carolina Department of Human Services, Raleigh, NC, 1987.
19. Brunelle, J.: Prevalence of dental sealants in U.S. schoolchildren. J Dent Res 68 (special issue): 183, March 1989.

Prenatal Care Comparisons Among Privately Insured, Uninsured, and Medicaid-Enrolled Women

CHARLES N. OBERG, MD
BETTY LIA-HOAGBERG, PhD
ELLEN HODKINSON, BSN
CATHERINE SKOVHOLT, MS
RENEE VANMAN, BS

All the authors are with the School of Public Health, University of Minnesota. Dr. Oberg is an Assistant Professor of Pediatrics, Dr. Lia-Hoagberg is an Assistant Professor of Maternal and Child Health, Ms. Hodkinson and Ms. Vanman are Research Assistants, and Ms. Skovholt is a Research Fellow, all in Maternal and Child Health.

This research was funded by Hennepin Faculty Associates, Minneapolis, MN.

Tearsheet requests to Dr. Lia-Hoagberg, School of Public Health, Box 197, Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455.

Synopsis

Women without health insurance and those covered by Medicaid have been shown to obtain prenatal care later in pregnancy and make fewer visits for care than do women with private insurance. Factors that keep women from obtaining care include inadequate maternity care resources, difficulty in securing financial coverage, and the psychosocial issues of pregnancy.

This study identified and compared prenatal care use patterns, insurance coverage changes, and psychosocial factors among 149 women in Minneapolis, MN, with private health insurance, Medicaid, and no health insurance. Little information has been available on the insurance status of women at the start of pregnancy and the paths subsequently taken to obtain financial coverage for prenatal care.

A sample of 149 women who recently delivered children was obtained from 6 hospitals (1 public and 5 private) in Minneapolis, MN, between February and June 1988. The sample included 49 uninsured women, 50 privately insured women, and 50 receiving Medicaid benefits. The sampling process began when a woman without insurance coverage at the time of delivery was identified and agreed to participate. A woman with private insurance coverage and one enrolled in Medicaid were then randomly chosen from the same hospital within 1 week. All the women in the study were chosen by this procedure.

Prenatal care use was classified using the Kotelchuck Adequacy of Prenatal Care Utilization Index (*1*). Data analysis was conducted using descriptive statistics, chi-square tests, and ANOVA. Distinct sociodemographic differences were identified among the three insurance groups for age, education, marital status, and income. Findings indicated that 76 percent of the women enrolled in Medicaid had incomes below the Federal poverty level, compared with 31 percent of the uninsured and only 4 percent of the women with private insurance.

Results

At the end of pregnancy, women with private insurance (82 percent of the 50) were more likely ($P<.01$) to obtain adequate prenatal care than women with no insurance (59 percent of 49) or Medicaid benefits (50 percent of 50). The Medicaid group began receiving care at 20 weeks, later than either the uninsured (15 weeks) or the privately insured (12 weeks). Nineteen percent of the total sample had a change in insurance coverage between the beginning of pregnancy and the time of delivery. Most changes were among uninsured women who obtained Medicaid or private insurance coverage during their pregnancies (table 1).

13. Ismail, A. L., Burt, B. A., and Brunelle, J. A.: Prevalence of dental caries and periodontal disease in Mexican American children aged 5–17 years: results from the southwestern HHANES, 1982–83. Am J Public Health 77: 967–970 (1987).
14. Ragno, J., and Castaldi, C. R.: Dental health in a group of migrant children in Connecticut. J Conn State Dent Assoc 56: 15–21 (1982).
15. Call, R. L., Entwisle, B., and Swanson, T.: Dental caries in permanent teeth in children of migrant farm workers. Am J Public Health 77: 1002–1003 (1987).
16. Johnston, H. L.: Healthy for the nation's harvesters. National Migrant Workers Council, Inc., Farmington Hills, MN, 1985.
17. Oral health surveys – basic methods. Ed. 3. World Health Organization, Geneva, 1987.
18. Procedures and training manual for North Carolina Oral Health Survey 1986–87. Dental Health Section, Division of Health Services, North Carolina Department of Human Services, Raleigh, NC, 1987.
19. Brunelle, J.: Prevalence of dental sealants in U.S. schoolchildren. J Dent Res 68 (special issue): 183, March 1989.

Prenatal Care Comparisons Among Privately Insured, Uninsured, and Medicaid-Enrolled Women

CHARLES N. OBERG, MD
BETTY LIA-HOAGBERG, PhD
ELLEN HODKINSON, BSN
CATHERINE SKOVHOLT, MS
RENEE VANMAN, BS

All the authors are with the School of Public Health, University of Minnesota. Dr. Oberg is an Assistant Professor of Pediatrics, Dr. Lia-Hoagberg is an Assistant Professor of Maternal and Child Health. Ms. Hodkinson and Ms. Vanman are Research Assistants, and Ms. Skovholt is a Research Fellow, all in Maternal and Child Health.

This research was funded by Hennepin Faculty Associates, Minneapolis, MN.

Tearsheet requests to Dr. Lia-Hoagberg, School of Public Health, Box 197, Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455.

Synopsis

Women without health insurance and those covered by Medicaid have been shown to obtain prenatal care later in pregnancy and make fewer visits for care than do women with private insurance. Factors that keep women from obtaining care include inadequate maternity care resources, difficulty in securing financial coverage, and the psychosocial issues of pregnancy.

This study identified and compared prenatal care use patterns, insurance coverage changes, and psychosocial factors among 149 women in Minneapolis, MN, with private health insurance, Medicaid, and no health insurance. Little information has been available on the insurance status of women at the start of pregnancy and the paths subsequently taken to obtain financial coverage for prenatal care.

A sample of 149 women who recently delivered children was obtained from 6 hospitals (1 public and 5 private) in Minneapolis, MN, between February and June 1988. The sample included 49 uninsured women, 50 privately insured women, and 50 receiving Medicaid benefits. The sampling process began when a woman without insurance coverage at the time of delivery was identified and agreed to participate. A woman with private insurance coverage and one enrolled in Medicaid were then randomly chosen from the same hospital within 1 week. All the women in the study were chosen by this procedure.

Prenatal care use was classified using the Kotelchuck Adequacy of Prenatal Care Utilization Index (*1*). Data analysis was conducted using descriptive statistics, chi-square tests, and ANOVA. Distinct sociodemographic differences were identified among the three insurance groups for age, education, marital status, and income. Findings indicated that 76 percent of the women enrolled in Medicaid had incomes below the Federal poverty level, compared with 31 percent of the uninsured and only 4 percent of the women with private insurance.

Results

At the end of pregnancy, women with private insurance (82 percent of the 50) were more likely ($P<.01$) to obtain adequate prenatal care than women with no insurance (59 percent of 49) or Medicaid benefits (50 percent of 50). The Medicaid group began receiving care at 20 weeks, later than either the uninsured (15 weeks) or the privately insured (12 weeks). Nineteen percent of the total sample had a change in insurance coverage between the beginning of pregnancy and the time of delivery. Most changes were among uninsured women who obtained Medicaid or private insurance coverage during their pregnancies (table 1).

OREGON