

A Plan To Prevent Adolescent Pregnancy and Reduce Infant Mortality

DIPALI V. APTE

Ms. Apte's proposal won first prize in the contest for the 1986 Secretary's Award for Innovations in Health Promotion and Disease Prevention. The contest is sponsored by the Department of Health and Human Services.

When Ms. Apte competed for the award she was a second year medical student at Rush Medical College, Chicago. Presently she is studying at the University of Illinois, Urbana, for her PhD in biophysics.

Tearsheet requests to Ms. Apte, 1703 D Valley Rd., Champaign, IL 61820.

Synopsis.....

In Illinois, particularly in Chicago, the infant mortality rate is higher than that for the nation as a whole. Unless infant mortality in Illinois declines at a faster rate, the State will not meet the objective for reducing infant mortality specified by the Surgeon General of the Public Health Service.

Low birth weight infants are at high risk of medical problems, if not death, and teenage

mothers have an increased risk of bearing low birth weight infants. This paper presents a program aimed at the primary prevention of adolescent pregnancy. The three-component, interactive program—sex education, adolescent clinic services, and community support and involvement—is proposed for preventing adolescent pregnancy which, in turn, will decrease the rate of births of low birth weight infants and, consequently, the rate of infant mortality in target areas of Illinois.

Medical and college students will be trained to teach the sex education course and to serve as counselors. A clinic will provide primary care, contraceptive education, and access to contraceptives. The clinic staff will be a resource for the community as well as for the adolescents. In the target areas, church and community members will sponsor health fairs and discussions of adolescent pregnancy at church and at parent-teacher association meetings. The overlapping activities of the instructors, clinic personnel, and church and community members will give continuity and consistency to the prevention message directed to the adolescents.

THE CORRELATION of low birth weight with infant mortality and teenage childbearing generates the notion that infant mortality rates would be reduced if adolescent pregnancies were prevented. In this paper I propose a three-part program aimed at the primary prevention of adolescent pregnancy.

Background

The decline in infant mortality during the period 1900-50 resulted largely from a decrease in the number of environmentally caused deaths during the postneonatal period, 28 days to 11 months. By 1950, two-thirds of all infant deaths occurred in the neonatal period, 0 to 27 days (1, 2). Two-thirds of those deaths occurred among low birth weight (LBW) infants—infants weighing less than 2,500 grams—their immaturity predisposing them

to medical problems (1). Neonatal intensive care services (rather than fewer births of LBW infants) caused the drop in the infant mortality rate from 24.7 to 13.1 per 1,000 live births between 1965 and 1980 (3). These data, coupled with the fact that LBW infants are five times more likely than normal weight infants to die within 1 year, show clearly that the prevention of LBW infants is a priority (3,4).

Infant mortality is a significant problem in Illinois. The rate statewide in 1982 was 13.6 per 1,000 live births (10.7 for whites and 24.5 for blacks); the rate for Chicago was 18.6 (12.1 for whites and 25.7 for nonwhites). In comparison, the rate for the nation was 11.2. In 1984 the rate for the State was 12.0 and 20.4 for blacks in Illinois (4).

Although the percent LBW of total births in the United States declined from 7.1 to 6.8 during the

period 1977–81, it remained unchanged at 7.5 for the State of Illinois and increased slightly from 10.2 to 10.5 for Chicago (5).

The factors that contribute to the risk of bearing a LBW infant are these:

- *Bearing children at an early age.* Teenage mothers, especially those under 17 years of age, are at highest risk.
- *Having low socioeconomic status.* Low socioeconomic status—as determined by social level, income, education, and census tract—correlates with an increased risk of premature delivery and retarded intrauterine growth.
- *Being poorly educated, being unmarried.* Women who have less than 12 years of education or who are unmarried, or both, have an increased risk of bearing LBW infants.
- *Being black.* Blacks are more likely to begin childbearing during adolescence, have low socioeconomic status, have less education, and remain unmarried. Therefore, blacks are at greater risk than whites of bearing LBW infants (3,6).

The LBW infant has an increased risk of becoming a child who fails at school, who has behavioral problems, and who develops neurodevelopmental handicaps (1), congenital anomalies, and lower respiratory tract infections (3). Because of chronic illness, the infant is a source of monetary and emotional stress for the parent or parents (1). Mother-child bonding is decreased with a low birth weight infant (7), a situation that gives rise to abnormal relationships (8) and, together with the socioeconomic factors, promotes a vicious cycle of adolescent pregnancy and teenage parenthood (9). In other words, the children of adolescent parents are at increased risk of becoming adolescent parents.

The percentage of births to Chicago teenagers has not changed significantly since 1970. In 1970 it was 21.5 percent of all births, in 1978 it was 22.6 percent, and in 1982 it was 19.9 percent. However, the differences in the percentages between blacks and whites were striking: In 1982 births to black teenagers were 25.6 percent of all black births; births to white teenagers were 12.5 percent of all white births (5).

The ramifications of adolescent pregnancy go beyond an increased risk of a LBW infant. In 1976, 32.0 percent of all abortions were performed on teenagers (10). In 1983 there were 1,515,000 abortions; approximately 26 percent of them were performed on teenagers 15–19 years old (11). If

the fetus is carried to term, the adolescent is likely to withdraw from school before being graduated, which limits her ability to provide for herself. Often she becomes dependent on public aid or accepts employment in jobs paying, on the average, half the wages that women who bear children after the age 20 are paid (12). The burden of caring for an ill child can adversely affect employment opportunity and marital stability (1). For the past few years approximately 50 percent of teenage mothers have been unmarried (13). These are some of the factors keeping young women in poverty (5,14).

Meeting the 1990 Objectives

Despite a statewide decline in Illinois in the infant mortality rate, there has been little decline in the rate of postneonatal deaths, no change in the rate of LBW infants, and no decrease in the gap between rates of whites and nonwhites.

In 1980 the Surgeon General of the U.S. Public Health Service specified that the infant mortality rate be reduced by 1990 to 9.0 per 1,000 live births nationally and to 12.0 per 1,000 live births for nonwhites. A concurrent target rate of 5.0 percent LBW infants of all births was set also. The Governor's Infant Mortality Reduction Initiative for Illinois (IMRI) indicates that the State will not achieve those goals unless the rate of births to LBW infants declines more rapidly than it has in recent years (4).

Preventing Adolescent Pregnancy

Features of successful programs. A review of several successful programs provides a basis for the development of an effective program. The St. Paul Maternal and Infant Care Project's health clinic in a junior-senior high school showed a decrease in the pregnancy rate from 79 to 35 per 1,000 women from 1973 to 1976 with a concurrent 12-month contraception continuation rate of 86.4 per 100 women. Consistency of the staff offering services—the same persons staffed the different program sites so that trust was established through familiarity—confidentiality, accessibility, free services, involvement of male partners and parents, and provisions of educational and social services contributed to the program's success (15,16). By offering continuous educational services, the Webster Girls' Junior-Senior High School in Washington, DC, experienced a low repeat pregnancy rate among the participating students (17).

Illinois areas with the highest infant mortality rates

Communities	Percent black	Percent births to teens	Infant mortality rate
Greater Grand Crossing.....	99	24.1	32.10
Grand Boulevard.....	99	37.8	30.64
Englewood.....	99	41.9	28.61
Roseland.....	98	28.9	27.74
Near West Side.....	75	31.2	27.54
Cook County Area 1 (Dixmoor, Harvey, Phoenix, Robbins).....	73	27.2	26.08
Woodlawn.....	96	27.9	25.99
West Garfield Park.....	99	34.3	25.78
Washington Park.....	99	37.6	25.63
East Garfield Park.....	99	35.8	25.60
South Shore.....	95	19.5	24.35
West Englewood.....	98	34.0	24.22
West Pullman.....	91	27.6	24.15
Austin.....	74	25.2	22.77
Oakland.....	99	41.6	22.77
North Lawndale.....	97	35.4	22.71
Douglas Park.....	87	27.5	22.15
Cook County Area 3 (Worin).....	0	10.0	21.86
Fuller Park.....	99	39.2	21.42
Cook County Area 2 (Chicago Heights, East Chicago Heights).....	37	23.0	21.39
Southern Seven/Cairo ¹	46	26.5	20.52
Humboldt Park.....	36	24.2	20.50
Kankakee/Kankakee ¹	28	22.5	19.68
Riverdale.....	97	33.4	19.60
Vermilion/Danville ¹	16	21.0	19.28
St. Clair/East St. Louis ¹	96	32.6	19.01
Macon/Decatur ¹	15	17.8	17.68

¹Denotes areas outside Chicago and vicinity.

SOURCES: Data compiled by the Illinois Department of Public Health Vital Records. Percent births to teens and infant mortality rate data are for 5 years, 1979-83; percent blacks are 1980 census data.

The Detroit Teen Center provides education about contraceptives; teenagers serve as the major source of sex information for their peers (2,18). Sex education programs targeted to the male adolescent help to improve the use of contraceptives (17,18). To deter pregnancy, the Los Angeles Crittenton Center impresses upon teenagers the reality of pregnancy and childrearing through group discussions (14). Knowledge of contraceptive use coupled with access to contraceptives has been shown to sharply decrease the pregnancy rates (14,19).

Existing programs in Illinois. The Parents-Too-Soon program in Chicago provides a number of services: family planning; prenatal, postnatal, and perinatal care; health and nutritional education; day care for infants and children of teens; family life and sex education; well baby care; activities for parents; and so forth. Although the program offers comprehensive health, social, and educational services for adolescents, only adolescent parents and pregnant teens use those services. The

IMRI has proposed expanding those services to include primary prevention of pregnancy through clinics for adolescents and public awareness programs (4). There are a few clinics for adolescents and many sex education programs in Chicago (I obtained this information in an interview December 23, 1985, with D. Shavers, Program Director of the Chicago Youth Club). Considerable effort is directed at reducing infant mortality, but most programs tend to be aimed at too broad (citywide or statewide) or too narrow (limited to school or clinics) an area. Also these programs have a limited ability to reinforce their prevention message.

Target population and areas. Views on the causes of unwanted pregnancy indicate that puberty is the first vulnerable stage, followed by a second stage in mid-adolescence (10,20). Adolescent women are likely to become pregnant soon after they become sexually active. One study shows that one-fifth of 544 women became pregnant within 6 months of becoming sexually active (21). These data, and the fact that among sexually active females adolescents are least likely to use contraceptives, suggest that the target population must include adolescents ages 13-14 years. And junior and senior high schools make ideal locations for targeting that population. (Female adolescent high school dropouts are not actively targeted in the program I propose because of the evidence that withdrawal from school is often the result of adolescent pregnancy (21).)

Under IMRI, the Chicago Department of Health has identified 27 communities in Illinois as those areas (census tracts) having the highest infant mortality rates (table) in the State (4). Of those, only five are outside Chicago and vicinity. These demographic features indicate that by targeting the proposed program at adolescents (male and female) in the areas having predominantly black populations, it will reach the adolescents at highest risk of pregnancy.

Proposed Program

The proposed program aims to provide a comprehensive and focused approach to the primary prevention of adolescent pregnancy. It has three components: sex education, medical services, and community awareness and support. It will involve medical and college student instructors, the adolescent clinics' staffs, and leaders of the community, churches, and junior and senior high schools. Interactivity will be accomplished by overlapping the functions of the persons involved.

Sex education. Some avenues already exist for expediting sex education among the inner-city adolescents. The Chicago Youth Clubs are working with Partnership-In-Health (PIH) to teach adolescents about health issues; their curriculums may be expanded to include sex education. Medical students from Rush Medical College, Northwestern School of Medicine, Loyola-Stritch School of Medicine, University of Illinois' College of Medicine and College of Pharmacy, Chicago Medical School, and several other institutions visit the classrooms of inner-city high schools and present programs aimed to stimulate learning and emphasize the importance of education. At some of these medical schools, third and fourth year medical students who are working on their obstetrics and gynecology clerkships teach sex education to inner-city youths. The present alliances and interests on the part of medical students will provide the necessary contacts and manpower to establish the proposed program. Contacts between medical schools and communities will exist in downstate areas as well.

Male and female medical students will serve not only as instructors-counselors but also as good role models, especially when they teach students who are ethnically or racially similar to themselves. Junior and senior college students and community church members also may serve in this capacity. To function in this multiple role, the counselors will be trained to understand adolescent psychosexual development and the psychosexual factors that contribute to pregnancy (20). They will be expected to have a basic knowledge of male and female anatomy, the physiology of the sexual response, and the physiological changes during adolescence and pregnancy. Further, they must know the symptoms, methods for preventing, and the myths surrounding the various kinds of sexually transmitted diseases including Acquired Immunodeficiency Syndrome. They must know about genetic diseases, contraceptives (the kinds, their function and application, the efficacy of each kind, and the myths), and the family planning services available locally (location, functions, and how the services are coordinated). The educators must use proper sex education terminology and be familiar with teenage jargon (17). They also must become familiar with visual aids used in teaching and with sample contraceptive packages.

The educators-counselors will be taught leadership skills for (a) facilitating discussions, (b) conducting and designing projects such as watching and helping mothers to care for their infants,

(c) estimating a week's budget, and (d) conducting games that initiate discussion about the realities of pregnancy and childrearing. Further, they will make presentations at health fairs and attend community forums on adolescent pregnancy.

To limit the cost of training, professionals from the medical schools, affiliated hospitals, and city and State public health departments will provide the training as well as the essential educational materials. To encourage commitment to teaching, the instructors-counselors will be offered course credit for their teaching services, by arrangement with their schools, or given wages, or both. (Suggested hourly rates are \$7-\$8 for college students and \$10-\$11 for medical students for time they spend training, teaching, and commuting.)

The sex education course will be a required part of each junior and senior high school's curriculum. It will provide time for instruction and a 1-2-hour discussion period each week. The instruction portion will include the topics mentioned earlier (and box), and the discussion portion will include other topics as well, such as the problems and questions the class members may have and what their goals are and ways to achieve them. To extend the course into the community, the students will undertake individual or group extracurricular projects. Boys and girls will take classes together to maximize interaction and discussion (17).

Pretests and posttests will be administered to the class members to assess the course's effectiveness. Optional tests may be given to assess weaknesses in understanding specific topics. These features will provide guides for modifying the course's structure and content. Materials such as paper and rented films will be supplied by the school.

Adolescent clinics. The clinic will serve as a primary care and referral center. The staff will include a primary care physician and several nurses or nurse practitioners to ensure complete care for the adolescents. Services to be provided will include Pap smears, pregnancy testing, venereal disease testing and treatment, general physical examinations, vaccinations, and contraceptive counseling, to name a few. Contraceptives will be dispensed at low cost or without charge.

The clinic will operate from rooms in the high school or adjacent buildings, in community centers or municipal buildings. It will be open during after-school hours and on Saturdays. Confidentiality will be guaranteed. However, if the students want to be accompanied by their parents, the parents' presence will be encouraged.

Format for Sex Education Course and Directions for Instructors

Week 1: Introduction. Inform students about the course's contents, requirements, and goals and answer questions. Administer the pretest. Collect note cards with questions about topics of major concern to the students.

Week 2: Group discussion. Discuss the questions submitted by the students.

Weeks 3-5: Anatomy and physiology. Have clinic personnel and experts teach this part. Use visual aids.

Week 6: Contraceptives. Begin with a discussion of examples of contraceptives. Arrange for clinic personnel to discuss access to contraceptives.

Week 7: Egg-carrying project. Give one raw egg to each student. Instruct the students to bring the egg each week for the next 4 weeks and to keep a diary of their feelings about carrying the egg. (This exercise is designed to impress upon adolescents the fragility of the egg and about the care and time involved in carrying it.)

Week 8: Sexually transmitted diseases. Discuss the kinds, modes of transmission, symptoms, and treatment of sexually transmitted diseases, including AIDS.

Week 9: Services available in the community and adolescent clinic. Inform the students about the kinds, functions, and coordination of available

services. Invite a clinic staff person to discuss the clinic's services. Administer a test (optional) based on the material covered during weeks 3-9.

Week 10: Group discussion. Collect the students' diaries on the egg-carrying project. Discuss the similarities between the egg and caring for an infant, the realities of caring for a child and its effect on an adolescent's life. Discuss the responsibility for another's life—and how little an adolescent will be able to provide for an infant.

Week 11: Group discussion. In a round-table setting, moderate a discussion of what factors will help to provide and detract from each of the course's goals.

Week 12: Conclusion. Discuss the results of the pretest and posttest. Address topics that were incorrectly answered on the posttest. Summarize the course, emphasizing the salient points. Discuss extracurricular projects that students will do for 4 weeks.

Weeks 13-17: Extracurricular projects. The students are to participate in activities such as those mentioned earlier (helping mothers to care for infants and so forth).

Week 18: Final group discussion. Informally discuss the outcomes of the projects. (The purpose of this session is to maintain contact with the students.)

The clinic staff will help train the educators-counselors and help teach the sessions on contraceptive use and venereal disease. They also will be involved in the health fairs, followup committees, and community rap sessions. They will be a resource for the community at large by providing open-house time for discussions on topics of concern to teachers, parents, and other members of the community.

Community-church involvement. The proposed program is designed to operate in conjunction with Partnership-In-Health (funded by the Chicago Community Trust), which unites the efforts of Cook County Hospital and Fantus Health Center (CCH-FHC) and churches in the community (22,23). The CCH-FHC provides the expertise and services; the churches supply publicity and space.

The goal of PIH is to involve health care consumers in their own health maintenance (9). As the result of considerable planning for the pro-

gram, PIH has established contacts in communities and churches around Chicago and has become funded. The PIH networks and the CCH-FHC services will facilitate the acceptance of the sex education course in junior high and high schools. The expertise of CCH-FHC personnel will be an asset in establishing the proposed clinics.

The PIH has generated considerable publicity about the health fairs in several target demographic areas. I expect such health fairs to be an excellent vehicle for disseminating information about the proposed clinics' services and on topics such as those covered in the proposed sex education course. During the PIH followup visits to communities, families of adolescents will be contacted by a committee of members of parent-teacher associations, churches, and clinic staff and the families will be encouraged to bridge the "communications gap" (24,25) by becoming involved in educating their child about sexual development. Parents who were teenage parents will be

encouraged to discuss with their children the hardships that resulted. Those parents also will be encouraged to impress upon their children the importance of staying in school (26).

Churches, which historically have been centers of culture for blacks, can help to enlist the support of the community in the target areas on behalf of the proposed program. The churches will be enlisted to provide discussions on community health problems as well as problems specific to male and female adolescents and on issues such as self-esteem and sense of responsibility. The clinic staff will supply the message on prevention that church leaders can incorporate in their activities. The church leaders will be encouraged to use the resources of the clinic staff and to include the staff and instructors-counselors in church activities.

Publicizing and Introducing the Program

To generate support for the proposed program, community gatherings and PIH health fairs will be used for publicizing the adolescent pregnancy-infant mortality problem. The help of community leaders in churches, schools, and other established institutions will be solicited in the publicity campaign. A limited media campaign on radio, television, and in newspaper editorials will publicize the problem and program further. The program's upcoming events will be posted in shopping centers, grocery stores, restaurants, youth clubs, as well as the churches and schools.

The evidence is that an increasing number of Americans favor sex education (27). Even so, to minimize opposition from and apprehension among parents, participation of the parents will be solicited at health fairs, churches, and parent-teacher associations. Rap sessions led by community leaders will serve as good forums for discussing the details of the sex education course and the purpose of the adolescent clinic. At such a discussion, a portion of the sex education course will be presented. It will be emphasized that the sex education given in the classroom serves as an alternate source of information and advice that complements rather than usurps the parents' role as guides for their children's ethical and religious development. Further, a bulletin that includes a schedule of topics to be taught in the sex education classes will be sent to the parents (a \$500 budget item, 25¢ per copy, 1,000 copies per high school each semester). The parents will be encouraged to discuss each topic at home with their children before the classroom presentation.

References.....

1. McCormick, M. C.: The contribution of low birthweight to infant mortality and childhood mortality. *N Engl J Med* 312: 82-90 (1985).
2. Thornburg, H. P.: A comparative study of sex information sources. *J Sch Health* 48: 88 (1972).
3. Institute of Medicine, Committee to Study the Prevention of Low Birthweight: Preventing low birthweight: summary. National Academy Press, Washington, DC, 1985, pp. 1-4.
4. Illinois Department of Public Health, State of Illinois Interagency Committee Advisory Task Force on Infant Mortality Reduction: Infant mortality reduction for the State of Illinois—report to Governor James R. Thompson. September 1985, pp. 1-46.
5. Commission for Health Planning and Resource Development: Health systems plan for the city of Chicago 1984-87. City of Chicago Health Systems Agency. Oct. 24, 1984, pp. 78-98.
6. Eberstein, I. W., and Parker, J. R.: Racial differences in infant mortality by cause of death: the impact of birthweight and maternal age. *Demography* 21: 305-321 (1984).
7. Silverman, W. A.: Incubator baby side shows. *Pediatrics* 64: 127-141 (1979).
8. Escalona, S. K.: Babies at double hazard: early development of infants at biologic and social risk. *Pediatrics* 70: 670-676 (1982).
9. Stengel, R.: The missing-father myth. *Time*, Dec. 9, 1985, p. 90.
10. Tietze, C.: Teen pregnancies: looking ahead to 1984. *In* Teenage sexuality, pregnancy, and childbearing. University of Pennsylvania Press, Philadelphia, 1981, pp. 150-154.
11. Henshaw, Stanley K.: Trends in Abortions 1982-84. *Fam Plann Perspect* 18: 34 (1986).
12. Center for Population and Family Health: Preventing adolescent pregnancy: the role of the family. Columbia University Colloquium, New York, June 19, 1981.
13. Dryfoos, J. G.: A time for new thinking about teenage pregnancy. *Am J Public Health* 75: 13-14 (1985).
14. Wallis, C.: Children having children. *Time*, Dec. 9, 1985, pp. 78-90.
15. Chamie, M., et al.: Factors affecting adolescents' use of family planning clinic. *Fam Plann Perspect* 14: 126-139 (1982).
16. Edwards, L. E., Steinman, M. E., Arnold, K. A., and Hahanson, E. Y.: Adolescent pregnancy prevention services in high school clinics. *In* Teenage sexuality, pregnancy, and childbearing. University of Pennsylvania Press, Philadelphia, 1981, pp. 372-381.
17. Withington, A. M., Gimes, D. A., and Hatcher, R. A.: Teenage sexual health. Irvington Publishers Inc., New York, 1983, pp. 61-101.
18. Scales, P., and Beckstein, D. L.: From macho to mutuality: helping young men make effective decisions about sex, contraception, and pregnancy. *In* Sexuality in education strategy resource guide: programs for young men. The Center for Population Options. Washington, DC, 1982, pp. 264-289.
19. Morris, J. N., and Heady, J. A.: Social and biological factors in infant mortality: 1. objectives and methods. *Lancet* 1 (No. 6859): 343-349 Feb. 12, 1955.
20. Miller, W. B.: Psychological vulnerability to unwanted

- pregnancy. *In* Teenage sexuality, pregnancy and childbearing. University of Pennsylvania Press, Philadelphia, 1981, pp. 350-354.
21. Zabin, L. S., Kater, J. F., and Zelnik, M.: The risk of adolescent pregnancy in the first months of intercourse. *In* Teenage sexuality, pregnancy and childbearing, edited by F. Furstenberg, R. Lincoln, and J. Menken. University of Pennsylvania Press, Philadelphia, 1981, pp. 136-148.
 22. Lattimer, A. D., and Lewis, M. C.: Proposal for a partnership-in-health. Cook County Hospital, Chicago, September 1984, pp. 1-61.
 23. Lattimer, A. D., Smith, R., and Lewis, M. C.: Grant proposal for funding of the partnership-in-health program. Cook County Hospital, Chicago, pp. 1-22.
 24. Bienvenu, M. J.: Parent-teenager communication: bridging the generation gap. Public Affairs Pamphlet No. 438, Ross Laboratories, 1971, pp. 1-4.
 25. Tepper, S. S.: So you don't want to be a sex object. Rocky Mountain Planned Parenthood, Denver, CO, 1978, pp. 1-27.
 26. Bellamy, C.: Preventing adolescent pregnancy: the role of the family [keynote address]. Center for Population and Family Health, Columbia University Colloquium, New York, June 19, 1981.
 27. Teenage pregnancy: the problem that hasn't gone away. Alan Guttmacher Institute, New York, 1981.

Minimizing Drug Misuse Among Elders: a Proposal

JEAN A. CRAIG
GAYLE B. EVES

The authors are students at the University of Michigan's School of Public Health. Their proposal won second prize in the competition for the 1986 Secretary's Award for Innovations in Health Promotion and Disease Prevention. The contest is sponsored by the Department of Health and Human Services.

Tearsheet requests to Ms. Jean A. Craig, 4760 Washtenaw #B4, Ann Arbor, MI 48108.

Synopsis.....

This proposal is aimed at reducing the risk of adverse drug interactions that may occur when over-the-counter (OTC) preparations are taken in conjunction with prescription drugs in an unsupervised regimen. Such polymedicating is practiced widely among the elderly.

A pilot program would be implemented over 12 months at three drugstores of a major retail chain.

A barcode-based computer system would be used to identify potential adverse drug interactions for elderly customers. All volunteers admitted to the study, controls and subjects, would agree to buy all their medications, prescriptions and OTC, at the participating pharmacies. In return, the volunteers would receive discounts of 25 percent on prescription and OTC drugs and 10 percent on vitamins.

Study subjects (N = 375) would carry barcoded identification (BID) cards that would activate the computerized program to assess each purchase for compatibility with their other medications; controls (N = 375) would carry "dummy" BID cards that would prompt the computer to approve all drug purchases. A final comparison of the subjects with the controls, as well as with a sample of elderly residents selected randomly from the community, would determine whether such a computerized, commercially based drug use review system could reduce the potential for adverse interactions between OTC and prescription drugs among the elderly.

OLD AGE AND CHRONIC AILMENTS go hand in hand. Of Americans ages 65 years and older, 20 percent have at least two chronic conditions, and 33 percent of those persons have three or more (1). Frequently, the medical therapy for treating multiple chronic conditions entails ingesting prescribed medicines and over-the-counter preparations concurrently—a form of polymedication that poses the threat of harmful drug interactions.

The conclusion that the elderly are at high risk of suffering adverse drug interactions from polymedication derives from data such as these:

- Over-the-counter (OTC) preparations constitute nearly two-thirds of all drugs consumed by sufferers of chronic conditions (2).
- The potential for adverse reactions becomes greater as the number of drugs ingested increases.