

Appendix D: EMPIRICAL STUDIES OF THE USE AND/OR
DETERMINANTS OF USE OF PREVENTIVE
SERVICES BY THE NON-ELDERLY

Study	Services examined	Period of time in which use is measured	Sample description and design	Analyses
American College of Physicians/Schwartz and Lewis, forthcoming ¹	Patient history Chest x-ray EKG Cholesterol Sigmoidoscopy Fecal occult blood Breast exam Pap smear Hepatitis B vaccine Influenza vaccine Pneumococcal vaccine Risk counseling	Measures date of last use	Survey mailed to 2000 ACP members asking about physician's preventive behavior for self and for patients	Relationships between self-reported physician preventive care for patients and practice characteristics, patient risk factors, demographics, medical knowledge, medical opinion and preventive care for self
Adams and Kerner, 1982 ²	Breast cancer screening (mammography and exam)	Not applicable	Retrospective survey of 2300 screeners in free NYC clinic	Demographic characteristics of users and source of knowledge about availability of service, recommended use
Blalock, DeVellis, and Sandler, 1987 ³	Fecal occult blood	Not applicable	Not applicable	Review article of six studies of compliance with FOB screening offer; focus on relationships between participation and age, other demographics, physical health status, family history, other preventive health practices, and health beliefs
Burack and Liang, 1987 ⁴	Pap smear Mammography Fecal occult blood Sigmoidoscopy Breast exam Pelvic exam Rectal exam	Not applicable	221 users of inner-city teaching hospital ambulatory care clinic	Rates of acceptance and compliance with offer of service; relationship between use and demographic, enabling and health belief variables (bivariate and multivariate)
Calnan, 1985 ⁵	Breast screening Cervical screening Dental checkup Dietary practice Exercise Smoking behavior Safety belt use	Study measures use of items except dietary practice and smoking behavior	Interview surveys with 2084 women 40 to 64 years drawn randomly from general practitioner registers in three English cities	Examined regular use of seven individual and multiple preventive behaviors; the relationships between use and sociodemographic characteristics, health status, attitudes, and social support/networks
Cohen, Littenberg, et al., 1982 ⁶	Periodic health exam (defined by American Cancer Society and Canadian Task Force recommendations)	Recent past	Experiment to increase preventive services given by physicians to patients from outpatient clinic of urban teaching hospital	Compared physician preventive knowledge, attitudes and compliance with preventive health recommendations between experimental and control groups; experimental group received checklists and education

Appendix D. --cont'd

study	Services examined	Period of time in which use is measured	Sample description and design	Analyses
Cummings et al., 1979 ⁷	Swine flu vaccine	Lifetime (albeit only offered within finite period)	Telephone survey of 286 adults randomly drawn from all households in Oakland City , Michigan	Uptake of swine flu vaccine as a function of Health Belief Model variables using regression and path analyses
David and Boldt, 1980 ⁸	None; examined patient attitudes toward preventive care	Not applicable	92 responses to mailed survey of random 10% of active patients of University of Kentucky Medical Center	Descriptive statistics of patient attitudes toward prevention, physician preventive function, time and cost of preventive care; bivariate relationships between attitudes and social position
Davidson et al., 1984 ⁹	Pap smear Fecal occult blood Breast exam Influenza immunization	3 years 1 year 1 year 1 year (for 65+) (or 1 year for all services: not clear)	Patients receiving outpatient care through university based general internal medicine practice during two 1-year periods; randomized trial; n=450	Effect of nurse-initiated reminder system of preventive services due; outcome measure is the difference in rate of compliance with recommendations between experimental and control periods
Harris and Guten, 1979 ¹⁰	Health protective activities including regular medical and dental checkups	Not applicable	Interview With 842 randomly selected adults from Cleveland, Ohio area	Relationships between constructed scales of health protective behavior and Health Belief Model variables (bivariate)
Hayward et al., 1988 ¹¹	Pap smear Breast examination Mammography Periodic health exam	1 year and 3-5 years 1 year 1 year 1 year	4659 women from random national telephone survey (1986 Access to Care Study)	Estimates of proportions of women receiving cancer screening within recommended periods of time; bivariate and multivariate analysis of correlates of use
Howard, 1979 ¹²	Mammography	Date of last use	Not applicable	Reviews four studies on use of mammography and three studies of major deterrents to physician use of mammography
Larison and Swint, 1976. 1978 ¹³	Preventive and non-preventive physician visits	1 year	5% random sample of 3892 individuals enrolled in large prepaid plan (Kaiser Portland)	Compared likelihood and volume of use of preventive and nonpreventive visits in an HMO as a function of health status, demographic, insurance, and other economic variables
McDonald et al., 1984 ¹⁵	Variety of screening services, immunizations, and weight reduction	Not applicable	115 resident physicians in a teaching hospital general medicine practice (61 study and 54 control, randomly assigned) studied over a 2-year period	Estimated the effectiveness of computer-generated reminder system in achieving compliance with medical indications for preventive and other procedures; analyzed the correlates of physician use and reasons for nonuse

Appendix A cont'd

Study	Services examined	Period of time in which use is measured	Sample description and design	Analyses
McPhee, et al., 1986 ¹⁵	Fecal occult blood Rectal exam Sigmoidoscopy Pap smear Pelvic exam Breast exam Mammography	From 1980 ACS recommendations: 1 year for all services except sigmoidoscopy and Pap smears which are 3 years	Stratified random sample of 323 adults from 52 providers in a university general medicine practice	Comparison of rates of use (based on ACS recommendations) with actual physician performance and physicians' perceptions of their performance; also examines correlates with use and of each service
Physician Employment Project/ DeFriesse, Madison, Konrad, et al., ongoing ¹⁶	General preventive care General immunizations Tobacco risk counseling Colorectal cancer screening Breast cancer screening	Not applicable	Cross-sectional telephone survey of members of 119 large medical group practices followed by mailed survey of 6000 physicians from these practices	Descriptive statistics of organizational policies toward selected preventive services, aggregate preventive physician visits, and physician attitudes; bivariate and multivariate analyses to test effect of individual, organizational, and environmental factors on these same outcome measures
MMWR, 1988a ¹⁷	Pap smear Breast exam	Measures date of last use	Interviews with 603 adult women randomly selected in four-stage process from a 36 county area of rural Kentucky	Knowledge and use of Pap smears and breast exams by age and other contact with the health care system
MMWR, 1988b ¹⁸	Mammography Breast exam Physician visit	year	852 Rhode Island women over 40 randomly selected from telephone numbers	Use of three preventive services by age, income, and education
MMWR, 1988c ¹⁹	Pap smear Breast exam Mammography Digital rectal exam Fecal occult blood Proctoscopy	Date of last use: <1 year or ≥1 year	1987 National Health Interview Survey Supplement on Cancer Control (1st quarter data: January-March)	Estimates of proportions of non-institutionalized adults over 40 years old with knowledge of and using each service broken down by gender and race
Rand, 1986 and 1987 ²⁰	Tetanus vaccine Pneumococcal vaccine Influenza vaccine Pap smear Mammogram Fecal occult blood Sigmoidoscopy Chest x-ray	3 years for a services	2276 enrollees in Rand health insurance experiment between 17 and 65 years; (separate analysis for children's use of preventive care)	Use of preventive services as a function of health insurance experiment cost-sharing plans; estimated efficacy of preventive care in terms of health status and costs; estimated cost of bringing use up to recommended levels
Riddiough et al., 1981 ²¹	Diphtheria vaccine Tetanus vaccine Polio vaccine Smallpox vaccine Asian flu vaccine Influenza B vaccine Swine flu vaccine	Not applicable	2 national random surveys of Opinion Research Company in 1977 and 1978; 2006 and 2080 adults in respective samples; also reviews some existing literature	Baseline public data on attitudinal health belief model variables (likelihood and seriousness of diseases, safety and effectiveness of vaccines, social factors, demographics, cost)

Appendix D. ---cont'd

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Komm, Fletcher, and Hulka, 1981 ²²	Risk counseling Medical history Pap smear Cholesterol Blood glucose EKG Urinalysis Fecal occult blood Lipid profile Tetanus vaccine Diphtheria vaccine	Used three sets of sets of time periods each broken down by age based on published expert recommendations	Sample of 31 North Carolina physicians and the medical records of 334 of their patients	Comparison of expert recommendations, surveyed physician opinion and actual physician use of preventive services, counseling, and medical history taking
Rundall and Wheeler, 1979 ²³	Preventive visits	year	Cluster sample of 781 completed household interview in Washtenaw County, Michigan	Path analysis of impact of income on volume of preventive visits; tests three hypotheses of income effect: direct (financial constraints), indirect via beliefs (culture of poverty), indirect via usual source of care (system barriers)
Salkever, 1976 ²⁴	General physical exam	1 year	Household samples of 4296 adults from Baltimore, Maryland, northern Vermont, and Saskatchewan, Canada collected as part of World Health Organization International Collaborative Study of Medical Care Utilization	Using multivariate regression analysis examined the effects of economic variables including income, insurance coverage, time costs on the likelihood adults receive a preventive examination
Satarino, Schwartz, and Swanson, 1982 ²⁵	Cervical cancer (Pap smear and pelvic exam)	Not applicable	34,135 women screened in Metro Detroit Cancer Control Program over 2.5-year period	Retrospective comparison of proportion of screeners seen in outreach clinics, standing clinics, and employee programs; estimated relative effectiveness of each clinic type in terms of rate of detected cancer by age and race
Sawyer et al., 1988, unpublished manuscript ²⁶	Pap smear	years	Interview survey of 149 black women 16-75 years old from rural North Carolina solicited door-to-door, referrals from social workers, other participants	Use of Pap smears as a function of health beliefs, provider, cues, income, education, and health insurance (bivariate and multivariate)
Slesinger, Tessler, and Mechanic 1976 ²⁷	General checkup TB skin test Blood pressure Urinalysis Complete blood count Pap smear Sickle cell (blacks only)		408 Blue Cross and 506 prepaid participant families drawn from two large industrial firms in Midwestern city	Use and volume of preventive services as a function of demographics, insurance type, and attitudes

Appendix D---cont'd

Study	Services examined	Period of time in which use is measured	Sample description and design	Analyses
Reitelbaum et al., 1986 ²⁸	Pap smears	Asks whether patients received smear in each of 10 previous years	Telephone surveys of 1200 women over age 45 drawn randomly and 400 physicians representing three specialties (general medicine, OB/GYN, and internists) from the State of Maryland	Physicians surveyed about their recommendations for frequency of Pap smear use; broken down by age of patient and specialty of physician; women surveyed about their own use of Pap smears in previous 10 years; broken down by age and specialty of regular source of
Thompson et al., 1986 ²⁹	Fecal occult blood	Not applicable (experiment)	Factorial design random trial of different cues to use FOB based on Health Belief Model; 500 members of HMO over 45 with existing physical exam appointment	Estimated effectiveness and cost-effectiveness of cues: physician talk, nurse talk, phone reminder, postcards, and combinations
Valente et al., 1986 ³⁰	Variety of health behaviors	Not applicable	Data from mailed survey of randomly sampled Maryland physicians	Estimates of physician beliefs and proportions of physicians reporting that they gather information from patients on 11 health behaviors broken down by career age and specialty
Warnecke, Havlicek, Manfredi, 1983 ³¹	Physical exam Prostate exam Pap smear Rectal/procto exam Breast self-exam	Within the 3.5-year study: annual, <annual, never	968 low-income adults over 35 drawn from stratified random sample of Illinois phone numbers	Multivariate model of determinants of use as a function of health belief, economic, demographic, and health knowledge factors
Wechsler et al., 1983 ³²	Variety of health behaviors	Not applicable	Data from survey of 490 randomly sampled Massachusetts of general medicine, internal medicine, and family practice physicians	Estimates of physician attitudes and beliefs and proportions reporting that they gather information and counsel patients on health behaviors
Williamson et al., 1988 ³³	Screening health exam	2 years	1788 adults from 47 family physicians' offices within a single State	Estimates of proportions of patients receiving exam within previous 2 years; proportions of patients who say they would accept physician recommendations to receive each of 10 preventive services offered (analyzed by age); knowledge of recommended services and health practices
Windsor and Morris, 1984 ³⁴	Hypothetical community health promotion program including diet control and smoking cessation	Not applicable	Survey of 400 randomly selected residents of urban Mobile, Alabama, age 20-69	Willingness to pay estimates by age for hypothetical program, projected use derived from self-reported risk factors, willingness to pay, and assumptions

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00 et al., 1985	History/physical exam Blood pressure Cholesterol Fecal occult blood Pap smear Mammogram Glaucoma Sigmoidoscopy EKG Serum glucose Rectal exam Breast exam Urinalysis Pelvic exam Chest x-ray	Rather than use a set period of time, authors calculate means of published and physician recommendations, generate expected number patients receiving each service for each physician, and compare actual numbers to expected numbers	63 physicians and 100 patients from an urban teaching hospital ambulatory care practice; actual use from patient records	Compares published recommendations, expected physician use, actual physician use, and patient desires for 16 preventive services

Abbreviations: ACP = American College of Physicians; ACS = American Cancer Society; EKG = electrocardiogram; FOB = fecal occult blood; HMO = health maintenance organization; MMWR = Morbidity and Mortality Weekly Report; OBGYN = obstetrician/gynecologist.

- 1s. Schwartz, University of Pennsylvania School of Medicine, personal communication, Philadelphia PA, Mar. 16, 1988.
- 2M. Adams and J.F. Kerner, "Evaluation of Promotional Strategies To Solve the Problem of Underutilization of Breast Examination/Education Center in a New York City Black Community," in *Issues in Cancer Screening and Communications* (New York, NY: Alan R. Liss, Inc., 1982).
- 3S.J. Blalock, B.M. De Vellis, and R.S. Sandler, "Participation in Fecal Occult Blood Screening: A Critical Review," *Preventive Medicine* 16:9-18, 1987.
- 4R.C. Burack and J. Liang, "The Early Detection of Cancer in the Primary-Care Setting: Factors Associated With the Acceptance and Completion of Recommended Procedures," *Preventive Medicine* 16:739-751, 1987.
- 5M. Calnan, "Patterns in Preventive Behaviour: A Study of Women in Middle Age," *Medical Care* 26:1040-1045, 1988.
- 6P.I. Cohen, B. Littenberg, C. Metzger, et al., "Improving Physician Compliance: A Study of Women in Middle Age," *Medical Care* 26:1040-1045, 1988.
- 7K.M. Cummings, A.M. Jette, B.M. Brock, et al., "Psychosocial Determinants of Immunization Behavior in a Swine Influenza Campaign," *Medical Care* 17(6):639-649, 1979.
- 8A.K. David and J.S. Boyd, "A Study of Preventive Health Attitudes and Behaviors in a Family Practice Setting," *The Journal of Family Practice* 11(1):77-84, 1980.
- 9R.A. Davidson, S.W. Fletcher, S. Retchin, et al., "A Nurse-Initiated Reminder System for the Periodic Health Examination," *Arch. Intern. Med.* 144:2167-2170, 1984.
- 10M. Harris and S. Guten, "Health-Protective Behavior: An Exploratory Study," *Journal of Health and Social Behavior* 20:17-29, 1979.
- 11R.A. Hayward, M.F. Shapiro, H.E. Freeman, et al., "Who Gets Screened for Cervical and Breast Cancer?" *Arch. Intern. Med.* 148:1177-1181, 1988.
- 12J. Howard, "Using Mammography for Cancer Control: An Unrealized Potential," *CA-A Cancer Journal for Clinicians* 37(1):33-48, 1987.
- 13D.R. Lairson, and J.M. Swint, "A Multivariate Analysis of the Likelihood and Volume of Preventive Visit Demand in a Prepaid Group Practice," *Medical Care* 16(9):730-739, 1978.
- 14C.J. McDonald, S.L. Hui, D.M. Smith, et al., "Reminders to Physicians From an Introspective Computer Medical Record," *Annals of Internal Medicine* 100:130-138, 1984.
- 15S.J. McPhee, R.J. Richard, and S.M. Solkowitz, "Performance of Cancer Screening in a University General Internal Medicine Practice: Comparison With the 1980 Cancer Society Guidelines," *Journal of General Internal Medicine* 1:275-281, 1986.
- 16G. DeFriese, Director, Health Services Research Center, University of North Carolina at Chapel Hill, personal communication, Washington, DC, May 20, 1988.
- 17Public Health Service, U.S. Department of Health and Human Services, "Screening for Cervical and Breast Cancer -- Southeastern Kentucky," *Morbidity and Mortality Weekly Report* 36(52):845-849, 1988.

- 18Public Health Service, U.S. Department of Health and Human Services, "Use of Mammography for Breast Cancer Screening -- Rhode Island, 1987," Morbidity and Mortality Weekly Report 37(23):357-360, 1988.
- 19Public Health Service, U.S. Department of Health and Human Services, "Provisional Estimates From the National Health Interview Survey Supplement on Cancer Control -- United States, January-March 1987," Morbidity and Mortality Weekly Report 37(27):417-425, 1988.
- 20L.A. Lillard, W.G. Manning, C. Peterson, et al., Preventive Medical Standards, Usage, and Efficacy (Santa Monica, CA: The Rand Corporation, 1986); and N. Lurie, W.G. Manning, C. Peterson, et al., "Preventive Care: Do We practice what we Preach," Am. J. Public Health 77(7):801-804, 1987.
- 21M.A. Riddiough, J.S. Willems, C.R. Sanders, et al., "Factors Affecting the Use of Vaccines: Considerations for Immunization Program Planners," Public Health Reports 96(6):528-535, 1981.
- 22F.J. Romm, S.W. Fletcher, and B. Hulka, "The periodic Health Examination: Comparison of Recommendations and Internists' Performance," Southern Medical Journal 74(3):265-271, 1981.
- 23T.G. Rundall and J.R.C. Wheeler, "The Effect of Income on Use of Preventive Care: An Evaluation of Alternative Explanations," Journal of Health and Social Behavior 20:397-406, 1979.
- 24D.S. Salkever, "Accessibility and the Demand for Preventive Care," Social Science and Medicine 10:469-475, 1976.
- 25W.A. Satariano, A.G. Schwartz, and G.M. Swanson, "Screening for Cervical Cancer: Results From Several Intervention Strategies," in Issues in Cancer Screening and Communications (New York, NY: Alan R. Liss, Inc., 1982).
- 26J.A. Sawyer, J. Earp, R.H. Fletcher, et al., "Pap Smears in Rural Black Women," from the Department of Medicine and School of Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, unpublished manuscript.
- 27D.P. Slesinger, R.C. Tessler, and D. Mechanic, "The Effects of Social Characteristics on the Utilization of Preventive Medical Services in Contrasting Health Care Programs," Medical Care 14(5):392-404, 1976.
- 28M.A. Teitelbaum, C.S. Weisman, A.C. Klassen, et al., "Pap Testing Intervals: Specialty Differences in Physicians' Recommendations in Relation to Women's Pap Testing Behavior," Medical Care 26(6):607-618, 1988.
- 29R.S. Thompson, M.E. Michnich, J. Gray, et al., "Maximizing Compliance With Hemocult Screening for Colon Cancer in Clinical Practice," Medical Care 24(10):904-914, 1986.
- 30C.M. Valente, J. Sobal, H.L. Muncie, et al., "Health Promotion: Physicians' Beliefs, Attitudes, and Practices," Am. J. Preventive Medicine 2(2):82-88, 1986.
- 31R.B. Uarnesker, P.L. Havlicek, and C. Manfredi, "Awareness and Use of Screening by Older-Age Persons," in Prospectives on Prevention and Treatment of Cancer in the Elderly, R. Yancik (ed.) (New York, NY: Raven Press, 1983).
- 32H. Wechsler, S. Levine, R.K. Idelson, et al., "The physicians Role in Health Promotion -- A Survey of Primary-Care Practitioners," N. Engl. J. Med. 308(2):97-100, 1983.
- 33P.S. Williamson, C.E. Driscoll, L.D. Dvorak, et al., "Health Screening Examinations: The Patient's Perspective," The Journal of Family Practice 27(2):187-192, 1988.
- 34R.A. Windsor and J. Morris, "Consumer Participation and parent for Health Promotion Programs at an Urban Primary Care Center," The Alabama Journal of Medical Sciences 21(2):209-213, 1984.
- 35B. Woo, B. Woo, E.F. Cook, et al., "Screening Procedures in the Asymptomatic Adult: Comparisons of Physicians' Recommendations, patients' Desires, Published Guidelines, and Actual Practice," J.A.M.A. 254(11):1480-1484, 1985.

SOURCE: Office of Technology Assessment, 1989.