

Cancer of the uterine cervix is not a disease restricted to young women. One-fourth of new cases of invasive cervical cancer occur in women age 65 and over; 1,867 elderly women died of this disease in 1986.

Compared to young women, elderly women appear to have lower rates of localized (noninvasive) tumors,<sup>1</sup> but they have higher rates of invasive cervical cancer. Elderly women are also more likely than younger women to have advanced (rather than early) invasive disease at the time of diagnosis.

The prevalence of invasive cervical cancer in elderly women is estimated to be between approximately 2 and 8 per 1,000, or roughly 38,000 to 152,000 women age 65 and over. Incidence is about 0.25 to 0.35 new cases per 1,000 elderly women per year, or about 4,800 to 6,700 new cancers each year. Across all ages, women at high risk of cervical cancer are those who are poor, are non-white, were young at age of first intercourse, have had multiple sexual partners, or smoke. Among elderly women, those who have not previously been screened are at especially high risk.

Pap smear screening, combined with appropriate treatment, is an effective method of reducing mortality and morbidity from cervical cancer. In areas where it has been introduced, Pap smear screening has generally been associated with lower mortality from the disease. Case-control studies have found that women who have been screened are two to ten times less likely than others to develop cervical cancer. The protection associated with prior screening is found in elderly women as well as among younger women. Elderly women, however, are less likely to be

screened than younger women and have seen less reduction in mortality rates than other groups. Future cohorts of elderly women may be better-screened, as the current group of younger women (with higher screening rates) ages.

Although elderly women as a group would reap benefits from cervical cancer screening, the implications of screening elderly women are different from those for younger women. Pap smears probably yield a higher proportion of both false positive and false negative tests in elderly women. Pap smears from elderly women are sometimes inadequate due to anatomical changes associated with age, which may increase the number of false negative test results. Also, some conditions that are prevalent in older women can lead to false positive test results. No studies directly comparing the accuracy of the Pap test in elderly and nonelderly women have been performed.

Medicare coverage of Pap smear screening is one possible measure to increase utilization of this test among elderly women. Until very recently, however, Medicare paid for Pap smears only as a diagnostic test (e.g., after symptoms of cervical cancer developed).<sup>2</sup> One consideration in the implementation of a screening benefit is the relative cost-effectiveness of different Pap smear screening schedules for elderly women. The cost-effectiveness model in this paper simulated the costs (to the health care system) and the benefits of Pap smear screening for a hypothetical cohort of women who enter the system at age 65. The results of the model indicate that Pap smear screening in elderly women does not appear to be very costly for

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1 The finding that elderly women have low rates of noninvasive tumors relative to their overall rate of invasive cancer may be due in part to lower screening (i. e., less opportunity to detect such symptomless tumors) in older women.

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2 The Omnibus Reconciliation Act of 1989 extended Medicare coverage to Pap smear screening. Tests are reimbursable if a woman has not had a Medicare-covered test within 3 years. The Secretary of the Department of Health and Human Services has the option to make high-risk women eligible for more frequent coverage. The benefit takes effect July 1, 1990.

the potential years of life saved from this technology, although it is unlikely to actually save health care costs.

Under base case assumptions, the model found that a single screening of women at age 65, when they became eligible for Medicare, would save 14,400 life years per 1 million women screened (discounted at 5 percent) and would cost the health care system \$1,666 Per year of life saved.<sup>3</sup> The incremental cost per year of life saved is least for 5-year screening (\$1,453) and is progressively greater as screening frequency increases. It amounts to \$5,956 per life-year saved for the incremental effects of a 3-year screening cycle over a 5-year cycle, and rises to \$39,693 for annual screening. The model considers only direct cancer-related health care costs and the benefits of lives saved. Potential benefits such as employment and disability-free days, and costs such as future medical costs incurred by extending life, are not included.

The cost-effectiveness of cervical cancer screening under base-case assumptions is comparable to other preventive services for elderly individuals. The cost-effectiveness of

Pap tests every 3 years is similar to that of vaccination against pneumococcal pneumonia (136,155); the cost-effectiveness of annual Pap tests is comparable to annual mammogram screening for breast cancer in elderly women (156).

The cost-effectiveness ratio for Pap smear screening depends heavily on the extent to which high-risk, rather than low-risk, women are screened. Low-risk women derive some benefit from screening, but at very high cost to the health care system. Screening only high-risk women, on the other hand, has a very low cost per life-year saved. This difference has implications for the results of the new Medicare benefit that extends coverage to all elderly women. The cost per life-year saved by screening could be considerably reduced if such a benefit were combined with measures to raise the utilization of the benefit by high-risk women above the average rate for the population as a whole (even though the resultant higher utilization would raise total program costs). Because the cost of screening is also highly sensitive to the accuracy of the test, increased investment in laboratory accuracy would likewise increase program effectiveness and reduce the cost per year of life saved.

Cervical cancer is only one of many gynecological diseases that can affect elderly women. Endometrial cancer, for example, is particularly prevalent in this age group (79). A negative Pap smear does not necessarily protect against other uterine cancers. The results of this paper cannot be used to draw any conclusions about the general need for gynecological care in elderly women.

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3 "Cost per year of life saved" is a measure that enables direct comparisons of different health interventions (in this case, cervical cancer screening at different time intervals). In this analysis, the medical costs of each screening program--including screening, diagnosis, treatment, and identification of women who had false-positive screening test--were weighed against the benefits of preventing deaths due to cervical cancer in women whose disease was detected by the screening program.