

A Systematic Literature Review of the Effectiveness of Community-based Strategies to Increase Cervical Cancer Screening

Margaret E. Black, PhD¹

Janet Yamada, MSc²

Valerie Mann, PhD³

ABSTRACT

Objective: To evaluate and summarize evidence of the effectiveness of interventions available to public health staff that could be used to increase cervical cancer screening to women.

Method: A thorough literature review was conducted, articles screened for relevance and assessed for quality.

Results: Of 42 relevant studies, 1 was rated 'strong', 18 'moderate' and 23 'weak'. Among the strong/moderate studies, 10 were aimed at disadvantaged women. The most frequently used intervention was mass media campaigns, alone or combined with individual strategies; followed by individual education using lay health educators; and last, letters of invitation. Thirteen of the moderate/strong studies evaluated strategies that reported statistically significant increases in Pap smear rates and other outcomes.

Conclusions: Strategies that combined mass media campaigns with direct tailored education to women and/or health care providers seemed most successful. The importance of accurate centralized cytology databases for recall is underscored.

La traduction du résumé se trouve à la fin de l'article.

Hamilton Social and Public Health Services, Community Support and Research Branch, PHRED Program, Effective Public Health Practice Project

1. School of Nursing, McMaster University & Hamilton Social and Public Health Services Department, Hamilton, ON
2. Hospital for Sick Children, Toronto, ON
3. Public Health Research, Education and Development, Kingston, Frontenac and Lennox & Addington Health Unit

Correspondence: Dr. Margaret Black, School of Nursing, McMaster University, 1200 Main St. W., 3N28H, Hamilton, ON L8N 3Z5, Tel: 905-525-9140, ext 22726, E-mail: blackm@mcmaster.ca. The technical report on which this paper is based is available at www.city.hamilton.on.ca/sphs/EPHPP/ephppSumRev.htm and copies of the tools are available from the corresponding author.

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Cancer of the uterine cervix is the eighth most frequently diagnosed cancer among Ontario women of all ages, and ranks eleventh in all cancer causes of death. However, its incidence ranks third and second among younger women aged 20 to 34 and 35 to 49, respectively.^{1,2} Ontario and Canada have some of the lowest rates of cervical cancer in the world³ and cervical cancer has a relatively good prognosis, with a five-year relative survival rate of 74%.⁴ In 2001, 610 Ontario women were diagnosed with cervical cancer, based on projected incidence, and an estimated 170 women died from it.⁵

Much of the decrease in the incidence and mortality of cervical cancer has been attributed to the use of the Papanicolaou, or "Pap" test.⁶ In Ontario, 88% of women aged 18 and over reported ever having had a Pap test.⁷ However, one in four women in Canada aged 18-69 had either never had a Pap test or not had one in the previous 3 years.⁴ Opportunistic methods are being used to recruit women, and while relatively successful, some women are being overscreened while others are not being screened at all.^{7,8} Characteristics associated with being underscreened include age, education,⁹ poverty, rural address, being an immigrant or Aboriginal, or speaking neither official language.^{2,3,10}

Recently, movement to replace opportunistic screening has begun. Ontario has established a province-wide screening program developed by a collaborative group represented by government, professional associations and key agencies. In 1997, the Public Health Branch of the Ontario Ministry of Health and Long Term Care released the Mandatory Health Programs and Services Guidelines (MHPSG). The objective for Early Detection of Cervical Cancer is to reduce cervical cancer mortality by 50% by the year 2005. Health Units are directed to "work with community groups, women and health professionals to co-ordinate services, identify gaps and barriers to screening and develop and implement strategies to increase recruitment for cervical cancer screening, particularly those in hard-to-reach groups."¹¹

The systematic review sought to answer the research question: "What is the effectiveness of strategies to increase women's participation in cervical cancer screening?" This paper evaluates and summarizes the

evidence on the effectiveness of strategies to increase the uptake of cervical cancer screening rates among women in community-based settings.

A Review and Advisory Committee was assembled from public health and cancer care practitioners, and experts in conducting systematic reviews. Their tasks included defining the question, determining the key search terms, identifying key informants and relevant databases, reviewing draft documents, and developing appropriate recommendations for research and practice.

Although the focus of the Mandatory Health Programs and Services Guidelines for Early Detection of Cervical Cancer is on hard-to-reach groups, this study included women of all ages and a broad range of sociodemographic variables who were living in the community. The interventions under study could be any individual, group or population strategy that was applicable to public health practice in Canada. The review excluded interventions that focussed on primary-care-based strategies, the focus of a subsequent review. The strategy could be aimed at increasing the uptake of cervical screening and could be directed towards women or health professionals, or both. The study design had to be prospective and include a control group (one group pre/post design was acceptable). Outcomes measured included screening knowledge, attitudes or behaviours, satisfaction, and cervical cancer incidence/prevalence. Publications in English or French were included. Studies that measured only process or health professional knowledge, attitudes or behaviour (other than screening rates) were not eligible.

METHOD

Literature review

A systematic search of published and unpublished literature was developed with two librarians from the Public Health Research Education and Development (PHRED) Program during July and September 1999. Forty-nine key words and/or MeSH terms were categorized as effectiveness, strategies, increase, participation, screening, and cervical cancer. The following computerized databases were searched from 1989 to September 1999:

TABLE I

Criteria to Assess Quality

Component	Criteria*
1. Sample Selection	Were selected individuals representative of the target population? What was the percentage rate for those who participated?
2. Study Design	If randomized or controlled clinical trial, rate as 'strong'. If cohort, case-control or time series, rate as 'moderate'.
3. Control for Confounders	Were important confounders controlled?
4. Blinding	Was outcome assessor aware of the intervention status of participants?
5. Data Collection	Were study participants aware of the research question? Were data collection tools shown to be valid and reliable?
6. Follow Up	How many study participants completed the study?

* Global scoring: a study was rated "strong" if it had four strong and no weak ratings, "moderate" if it had less than four strong ratings and one weak rating, and "weak" if it had two or more weak components ratings.

TABLE II

Glossary of Terms

Controlled clinical trial (CCT): compares one or more intervention groups to one or more comparison groups. While not all controlled studies are randomized, all randomized trials are controlled.³⁵

Randomized controlled trial (RCT): investigator randomly allocates eligible people into groups to receive or not to receive one or more interventions that are being compared. Results are assessed by comparing outcomes in the treatment and control groups.³⁵

One group, pre and post design: data are collected from the participants in one group before and after the introduction of an intervention.³⁶

Intermittent time series design: collection of information over an extended period of time, with multiple data collection points both before and after the introduction of an intervention to a group.³⁶

Cohort analytic: investigator identifies exposed and nonexposed groups of patients and then follows them forward in time, monitoring the occurrence of the outcome.³⁷

Lay health educator: lay people to whom others naturally turn for advice, emotional support and tangible aid. They provide informal, spontaneous assistance....supply information or advice, refer women for services and provide cues as to the social acceptability of health services.³⁸

Mass media campaign: major media (newspapers, radio and TV) are intended to reach large audiences, while minor ones (newsletters, bulletins and other notices) target specific audiences to heighten awareness, enhance other methods and create cumulative impact.³⁹

Letter of invitation: various methods (letters, postcards) which personally invite eligible women to attend screening services, or remind them that they are due to be screened. May be issued by a centralized registry if it exists, or through individual physicians to a central agency or directly from the family physician or women's clinic.

Medline, Current Contents, CINAHL, HealthSTAR, EMBASE, PsycInfo, Sociological Abstracts, and the Cochrane Library. Seven core journals were hand-searched back five years (1994-99) to ensure studies had not been missed by other methods. These were the *American Journal of Public Health*, *American Journal of Health Promotion*, *American Journal of Epidemiology*, *Canadian Journal of Public Health*, *Health Promotion International*, *Health Education and Behavior*, and *Journal of Epidemiology and Community Health*. Two other journals, *American Journal of Preventive Medicine*, and *Cancer Epidemiology Biomarkers and Prevention*, were also hand-searched. Persons in agencies such as Cancer Care Ontario were contacted, and a search in Dissertation Abstracts database was made to ensure other relevant published and unpublished

studies in English were identified. Unpublished studies in French were retrieved through a search of French language web sites and a manual search of DOCUMENSA (1990-1999).

Relevance and quality assessment

The retrieved abstracts or titles were screened independently by two reviewers. Their individual selections were pooled and retrieved as potentially relevant articles. Four pairs of reviewers independently rated the retrieved articles for relevance using a tool developed by the Effective Public Health Practice Project (EPHPP) team. The pair also identified potentially relevant studies from the reference sections of reviewed articles. Similarly, two French-speaking persons who were trained in the same method screened the French-language articles.

TABLE III

Summary of Included Studies Rated Moderate or Strong

Study	Design (Quality Assessment)	Participants and Intervention	Outcomes	Comments
Bird, 1998 ³⁰ USA	Cohort Analytic (Moderate)	Target: Vietnamese-American low-income women living in San Francisco (SF) compared to women in Sacramento (Pre surveys sampled 306; 339 and post surveys sampled 345; 372 in SF and Sacramento respectively). Intervenor: paid Vietnamese lay health workers; Vietnamese outreach staff and other team members. Setting: Community and homes. Intervention: Group education and various health days, contests and promotions. Free screening. Comparison City: No intervention.	In intervention group there was an increased rate of Pap test recognition from 22%-78% (p=0.001) Odds Ratio 52.7 (95%CI 28.3-98.0). Increased rate in those who ever had pap test from 46%-66% (p=0.001) OR 4.5 (95%CI 2.9-7.0). Increased rate in those who reported being up to date within 2.5 years of last Pap from 26%-45% (p=0.001) OR 2.4 (95%CI 1.6-3.6). No change in pre to post rate in comparison city.	Highly under-served population of those recently immigrated (e.g., 46% Pap smear rate in 1993). Resource-intensive interpersonal method reaches fewer than mass media methods, but authors suggest latter is an effective method for raising awareness, while face-to-face has greater effectiveness for changing screening behaviour.
Bowman, 1995 ¹²	Clinical Controlled Trial (Strong)	Target: Community survey identified women 18-70 years who had not been screened in previous 3 years in NSW (3 intervention groups: randomly allocated 219;220;220 and 1 control:219). Setting: Home Intervention: Group 1: Pamphlet with information, advice and invitation to reminder service. Group 2: Letter of invitation to free women's health clinic with female nurse practitioner. Group 3: Personalized letter from regular family physician (FP) advising screening (109/130 FP participated) Control: No intervention.	Group 3 (personalized letter) had Pap test rate of 36.9%, significantly greater (p=0.012) than other groups including control (25%,22.6%,24.5%). Predictors of screening included age, perceived screening frequency, oral contraceptives and membership in a FP group.	Male family physician did not act as a deterrent to screening. Pamphlet may be more useful among those who lack knowledge. Poor response to women's clinic may be due to excessive steps to book appt. Older women hard to reach. Possible testing effect of baseline survey may have minimized group differences.
Byles et al. 1994 ¹⁴ Australia	Cohort Analytic (Moderate)	Target: Women 18-70 years. Nine matched postal regions – randomly assigned to receive one of three intervention programmes. Compared to three matched regions. Post intervention community survey of 1001 women randomly sampled. Intervenor: Media and project staff. Intervention: Group 1: 30-second TV advertisement. Group 2: TV ad and letter of invitation. Group 3: TV ad and FP education over 6-month period. Comparison regions: No intervention.	Group 1: (TV ad) significantly increased rates (13%, p<0.00001) in rural center compared to control, though only small increases in previously unscreened. Group 2: (TV plus letters) increased rates in rural (52%, p=0.03) and rural centres (43%, p<0.00001). Group 3: (TV plus FP) all 3 regions showed increases (Compared actual rates to expected rates, and to rate in control regions).	Self report of media coverage likely over-estimated rates. Brief TV media campaign not likely to have an effect on screening. Media coverage varied across settings, confounding effect.
Byles et al. 1995 ¹⁵ Australia	Clinical Controlled Trial (Moderate)	Target: Adult women 18-70 years. Mailed questionnaire to 650 women in each of two intervention regions and to 650 women in one comparison region (N=1950). Intervention: Group 1: Personally addressed letter. Group 2: Same letter plus 5 targeted prompt cards. Comparison region: No intervention.	Group 1: (Letter only) 42.4% increase in women attending (Z=3.47, p<0.0001 for screening). Group 2: (Letter plus prompts) resulted in 39.6% increase (Z=3.2, p<0.0001). Both significantly different from control region.	Most women read letters but few reported use of targeted prompts – may be too complex.
Chou & Chen 1989 ¹³ Taiwan	Interrupted Time Series (Moderate)	Target: All adult women 25 years and older in Taiwan. 2 phases over 10 years. Intervention: Phase 1: FP education, mass media, brochures, films/exhibits of lectures, free pap tests. Phase 2: same as Phase 1 plus low-cost clinics.	Phase 1: First-time screeners represented 2.4% of Taiwan adult female population (n=77,599). Phase 2: Screeners were 3.3% of total population (n=129,357). Declines in overall mortality of cervical and uterine cancers seen among 40-49 years.	Program seems to have improved early detection. Program had low screening rate among women over 50 years old. Statistical differences not stated.
Del Mar et al. 1998 ³² Australia	Clinical Controlled Trial (Moderate)	Target: Vietnamese women aged 18-67 years identified from electoral roll. Intervention (n=359): Letter; media campaign: plus health talks. Control (n=330): Media campaign: no letter.	No difference in Pap smear rate one year later (Non significance).	Authors argue intervention not strong enough to overcome barriers.

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TABLE III – continued

Study	Design (Quality Assessment)	Participants and Intervention	Outcomes	Comments
Dignan et al. 1994 ²⁶ and 1998 ²⁸ USA	Solomon 4 Group Design (Moderate)	Target: Native American women 18 and older of the Lumbee tribe in North Carolina. 250 in each of 4 randomly allocated groups. Interveners: Trained lay health educators (LHE). Settings: homes. Intervention: Two visits, education, using a 10-minute videotape. Brochures, magnets, and mailings. Control: No intervention.	Women in program were 50% more likely to report Pap test than control (75% vs 67%) (OR=1.5, p<0.05) Knowledge gain (OR=1.54) No systematic effect of pretest on behaviour.	Intervention had a small significant effect on behaviour. Problems with contamination of controls and secular trends. LHE most useful for knowledge and intention. Needs more research on role.
Dignan et al. 1994 ²⁶ and 1996 ²⁸ USA	Solomon Four Group (Moderate)	Target: Native American women 18 years and older of the Cherokee tribe. 250 in each of 4 groups. Interveners: Trained lay health educators. Settings: homes. Intervention: Two visits using a 10-minute videotape. Brochures, magnets and mailings. Control: No intervention.	Six months post intervention, women in program groups were more than twice as likely to report Pap test than in control (OR=2.06, 95% CI=1.14-3.72) regardless of pretest. Other predictors: Younger, annual physical, history of abnormal pap.	Supports theory that individualized education produces positive changes in behaviour whereas community or group programs increase awareness. Pre-testing may have interacted with intention.
Hirst et al. 1990 ¹⁸ Australia	One Group (pre-post) (Moderate)	Target: Women 40 years and older. Interveners: Community health workers; health professionals. Intervention: Over one month gave educational sessions; TV and radio promotions; posters and brochures; workplaces and messages; FPs invited to meetings; free screening clinics.	Rates 2 months previous, during and 3 months post, there was 50% increase in Pap smear rates. (p<0.0001) After, declined to below pre-campaign rates.	FP attendance (27%) at meetings was low. Sustainability an issue: screening clinics were not permanent.
Holland et al. 1993 ²⁹ USA	Interrupted Time Series (Moderate) Over Three Time Periods	Target: Females 10-80 years, primarily poor, Black adult women in Newark. Interveners: Not specified. Intervention: Health education program including: ads, placards, talks, free clinic.	Lower ratios of in situ cancer to invasive cancer found during both periods I and III, compared to higher ratio in Period II (p<0.05) (the higher the ratio, the earlier the cancer detected).	Cessation of funding for education and screening can result in resumption of unfavourable in situ/invasive cervical cancer ratio. Race not a predictor.
Kelly et al. 1996 ²¹ USA	One Group (pre-post) (Moderate)	Target: Cambodian women 50 years and older (n=57). Interveners: 2 paid Cambodian peers and staff. Intervention: Cambodian videotape, reduced barriers (transportation, female examiner).	Pap smear rate changed from 13% of sample to 74% post intervention (p<0.001).	Unclear whether knowledge improvement or social interaction led to improved screening rates. Resource intensive, cultural knowledge important.
McAvoy & Raza 1991 ³¹ England	Clinical Controlled Trial (Moderate)	Target: Asian women in the city of Leicester on FP's registry. Three randomly allocated study groups (n=263;219;131), control (n=124). Interveners: Asian research assistant, volunteer translators. Intervention: Group 1: In home visit + leaflet/fact sheet and video, Group 2: In home visit + leaflet and fact sheet, Group 3: Mailed leaflet and fact sheet. Control: No intervention.	Group 2 (Leaflet, fact sheet, visit) 2.5 times more effective than sending by mail. (#3) Group 1 (Video and leaflet/fact sheet, visit) was almost 3 times more effective than mailing(#3). No difference between group 3 and control group.	Video was popular among Asians. Personal instruction was best form of education. Given low levels of literacy, written materials needed supplementing.
Michielutte et al. 1989 ²⁴	Cohort Analytic (Moderate)	Target: African-American women 18 or older in Forsyth County, NC	Intervention group reported significant increase in Pap smear rate ($\chi^2= 3.94$ p<0.05) compared to control group. High-risk women had significantly higher Pap smear rates compared to control.	Need more analysis before comparing high- and low-risk groups.
Dignan et al 1990 ²⁵ and 1994 ²⁶ USA		Pre-survey (n=474;477) and post survey (n=433;446). Intervention: Media, direct education, information to physicians, groups in homes, direct mail. Comparison region: No intervention in Durham County, NC		

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TABLE III – continued

Study	Design (Quality Assessment)	Participants and Intervention	Outcomes	Comments
Mitchell et al. 1997 ³⁴ Australia	One Group (pre-post) (Moderate)	Adult women of Non-English-Speaking background (NESB) compared to English-speaking women. Intervenors bilingual (12 languages) community workers. Intervention: Entire state exposed to radio; interviews; paid announcements and prizes; over 3 years for 1.5-2 months yearly.	Pap smear rates pre and 3 months post intervention. Media publicity generated an additional 6.7% (95% CI 4.4-9.2) increase in screening of women in high, non-English areas compared to women in low non-English areas.	Cannot differentiate relative effect among strategies used. Modest cost for use of ethnic media, especially radio. Confounded with secular trends.
Robertson et al. 1989 ³³ Scotland	Interrupted Time Series (Moderate)	Target: Women previously unscreened aged 50-60 years in 2 counties (n=1978). Intervenors: Family practitioners. Intervention: Letter of invitation (plus brochure) to receive smear from FP or clinic; then reminder; then after four months, sent default letter plus brochure.	Pap smear rates rose from 58% to 69% post call system. Better effect in rural (44% vs. large town (39.7%).	Community health index register promotes continual upgrading of information. Statistical significance not specified.
Shelley et al. 1991 ¹⁷ Australia	Cohort Analytic (Moderate)	Target: Women aged 18-70 years. Surveys pre (n=434) and post campaign (n=416) compared to expected rates and three control states. Intervention: Education media campaign TV & radio; educational package mailed to general practitioners. Control states: No intervention.	30% increase overall Pap smears and 52% (p<0.05) increase in women 50-69 years during 4 months post campaign, compared to control. TV had highest % recall for campaign.	Authors argue mass media acts as 'cue to action'. Unable to assess long-term impact. Control states likely contaminated by TV coverage.
Suarez et al. 1993 ¹⁹ and 1993 ²⁰ USA	One Group (pre-post) Over 2.5 Years (Moderate)	Target: Mexican-American and African-American 40-70 years of age. Surveys: (n=107), (n=82) in 2 communities, pre and post. Intervenors: Lay community and provider volunteers. Intervention: Role model stories, TV, radio and newspapers; newsletters.	No statistically significant increase in Pap smears (pre-post) but small improvements in favour of the intervention (Non significant).	Baseline rate (65-70%) relatively high, thus low power due to small sample. Difficult to overcome system barriers, e.g., staff and FP resistance to change, sustaining services, lack of one-stop centre.
Suarez et al. 1997 ¹⁶ USA	Cohort Analytic Over 3 Years (Moderate)	Target: Adult women in Texas, 40 years and older. Surveys: (n=450), (n=473) in El Paso compared to Houston. Intervenors: Peer volunteers and staff. Intervention: Role-model stories on TV, radio, newspaper; TV interviews; PSAs; newsletters. Comparison: No intervention.	Pap smear use in intervention women had a 5.9% increase, similar to comparison increase. Knowledge gain greater in comparison (19%) community, than in intervention (4%). (Non significant)	Intervention not intensive enough, too diffuse across community. Failed to gain media co-operation to run role-model stories. Insufficient screening resources to meet demand. Needed more intensive training and monitoring of staff and volunteers. Control Group: Contaminated by concurrent national campaign.
Tatum et al. 1997 ²² and Paskett et al. 1999 ²³ USA	Cohort Analytic Over 4 Years	Target: Low-income housed African-American women 40 years and older (n=125). Intervenors: 2 Lay out-reach workers. Interventions: one to one counselling; letters; mass media; community education; religious focus; information centers. Comparison community housing: No intervention.	Intervention reported an increase in Pap smear rates from 73% to 87% compared to a decrease in comparison group from 67% to 60% (p=0.004). High campaign recall and lower barriers in intervention group.	Bigger effect on younger women and women examined in last 12 months. Used self-reported test.

A generic quality assessment tool previously designed by the EPHPP team was used because of its established ability to produce consistent assessment of methodological quality. Table I lists the compo-

nent criteria and means to achieve an overall rating. Two raters independently assessed the quality of each relevant study using the form. Individual ratings were compared and consensus was reached on

each item. In cases of disagreement after discussion, a third person was asked to arbitrate. A data extraction tool designed by the EPHPP team was customized for this review. Two reviewers independently

TABLE IV

Summary of Intervention Effects on Outcomes (Pap Smear Rates and Cancer Incidence) for Studies with Significant Results

Intervention Used	Author(s)	Effect on Pap Smear Rates (see exception) of Women for Statistically Significant Studies
Mass Media Campaign combined with other strategies (e.g., group education, free screening, physician education, letters of invitation)	Byles et al. ¹⁴ Hirst et al. ¹⁸ Holland et al. ²⁹ Michielutte et al. ²⁴ Shelley et al. ¹⁷ Tatum et al. ²²	Up to 52% increase compared to no intervention region 50% increase compared to pretest – not maintained after campaign Increase in early cancer detection compared to pre and post periods Increased rate compared to no intervention county 30-52% increase compared to no intervention control 26% net difference between intervention and control African-American
Language-specific Mass Media Campaign only	Mitchell et al. ³⁴	6% additional increase in non-English-speaking women over increases from pretest in English-speaking regions
Letters of invitation only Personalized invitation from FP	Byles et al. ¹⁵ Bowman ¹²	40% increase compared to no intervention control 12% difference in rates compared to other mailings and control
Lay Health Educator or community volunteer using individual or group approach	Bird ³⁰ Dignan et al. ²⁸ Dignan et al. ²⁷ Kelly et al. ²¹ McAvoy et al. ³¹ Tatum et al. ²²	Over 3-fold increase among Vietnamese compared to no intervention control Two times more likely among North American Indian compared to no intervention control 50% increase among North American Indian compared to no intervention control 61% increase among Cambodian compared to pretest Three times more effective than mail strategy or control among Asian (Combined with Mass Media) 26% net difference between intervention and control African-American

extracted the data, and any discrepancies were discussed between the two reviewers. Primary outcome measures were identified and clinical/statistical significance was noted when possible.

RESULTS

Study characteristics

After the initial screen of the abstracts, a total of 428 articles were retrieved, of which 97 were found to be relevant. Neither hand-searching nor French-language retrieval identified other relevant articles. Because of the large number of relevant articles, reviewers grouped them into two categories: 1) interventions aimed at women in the community (n=50); and 2) interventions aimed at women/health care providers in primary care practices (n=47). This review focussed on the first group. Because there were multiple publications of a single study in a number of cases, further reduction left an overall total of 42 studies to be rated for quality.

Quality assessment classified 1 study as strong (2.3%), 18 studies as moderate (42.9%) and 23 as weak (54.8%). Among the strong and moderate studies, there were 6 controlled clinical trials (CCT), 6 cohort, 4 one-group pre/post studies, and 3 interrupted time series (see Table II for Glossary). Some studies were described as RCTs but were rated as CCTs if they failed to describe or conceal the randomization. Only the 19 strong or moderate studies are described in more detail.

No Canadian studies were located. Seven studies¹²⁻¹⁸ were directed at all

women living in cities/regions/counties or tribes, while the others were aimed at selected women within an area. Participants in 10 of the studies were disadvantaged¹⁹⁻³² (e.g., low income, poorly educated); however, in 8 studies, the samples were poorly described.^{14,15,17,18,29,32-34} Interventionists included research staff, lay peer educators, and health professionals. Seven of the 19 studies reported a theoretical basis for the intervention,^{14-16,19,20,22-28} with the most popular being the Social Cognitive Model. Interventions ranged from single, brief interventions (e.g., videotape) to multiple methods (e.g., mass media, individual counselling) delivered over several years. The most frequently used interventions were mass media campaigns, alone^{16,19,20,34} or combined with screening clinics^{13,18,29} or education,^{14,17,22-24,32} followed by individual education with free screening^{12,21,30,31} or mailed letters/reminders.^{15,25-28} One study used reminders only.³³ Nine studies used peer educators as interventionists.^{16,18-23,25-28,30,34}

Study outcomes

Table III displays details of the intervention and outcomes. Seventeen of the 19 studies measured Pap smear rates. All but 5 of these reported statistically significant improvements in rates compared to the control group, although in some, the net difference was small.¹² Clinical improvements ranged from 61% for an education video²¹ to 12% gain for a physician letter compared to a no-intervention group.¹² See Table IV for a summary of significant intervention effects by strategies

used. Of the 4 studies that used mass media campaigns alone, only 1 was effective³⁴ and that study targeted a specific subpopulation with language-specific material. All of the studies that combined mass media campaigns with other strategies^{14,17,18,22,24} were effective at increasing either Pap smear rates or early cancer detection.²⁹ Letters of invitation were effective^{12,15} but required a centralized registry or survey to identify eligible women. The authors of the 5 studies^{13,19,20,32,33} with no improvements identified limitations such as understaffing, low power to detect differences, and failure to address system barriers or they failed to report statistical significance. Other outcomes were gains in knowledge, recall of a media campaign, perceived barriers, behavioural intention, mortality, and ratio of *in situ* to invasive cancer rates.

DISCUSSION

The evidence from this systematic review suggests that a successful community program combines a mass media campaign with direct tailored information/education to women and/or health care providers. Shelley et al.¹⁷ contend that a mass media campaign's effectiveness lies in its "cue to action", raising awareness and knowledge, whereas individual education more directly affects behaviour. Reminder letters of invitation to women within the target population should also be considered but require an ongoing registry. Minority groups may be more responsive to small culturally sensitive group education rather than broad-

based community strategies. The use of lay health educators with minority women or new immigrants looks promising but is resource-intensive and generalizing to other cultural groups may not be valid. A successful program would measure Pap smear rates, self-reported knowledge, and barriers and would be sensitive to system and cultural factors. Adequate resources must be available to health departments, including ongoing training, and a population-based information system for follow-up and recall.

A number of limitations and strengths in the studies deserve note. The use of self-report of Pap tests was a potential source of bias that some studies avoided through the use of centralized databases of lab results. Dignan et al.²⁶ contended that pre-testing can interact with health education interventions, so that future studies might consider the post-test only design. Those studies that compared multiple interventions with no intervention did not allow a determination of the relative contribution of each strategy to outcome. Intervention integrity was affected by secular trends and by contamination of the comparison group, notably by concurrent mass media campaigns. Length of follow-up may have been too short to measure change. Sustainability of interventions is a concern that was identified by Hirst et al.¹⁸ and Holland et al.²⁹

Given the diverse populations and interventions reviewed, there is still much to be learned about community-based interventions in Canada. Qualitative studies could further explore some of the barriers that were reported such as age,¹² language,³² organizational capacity^{12,19} and lack of communication theory expertise.¹⁶ Exploring the range of activities taken by lay health educators would help to better understand their role and impact with various cultural groups.^{27,28} More rigorous evaluation research should be conducted in order to continue to assess the effectiveness of these and other strategies using validated reports of women's Pap smear rates.

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RÉSUMÉ

Objectif : Évaluer et résumer les preuves d'efficacité des mesures dont disposent les professionnels de la santé publique pour accroître le dépistage du cancer du col de l'utérus.

Méthode : Enquête bibliographique approfondie avec tri et évaluation des articles selon leur pertinence et leur qualité.

Résultats : Sur 42 études pertinentes, 1 seule était excellente, 18 étaient de qualité moyenne, et 23 étaient faibles. Dix des études de qualité moyenne ou excellente concernaient des femmes de milieux défavorisés. Les mesures les plus fréquemment utilisées étaient les campagnes dans les mass-média, seules ou combinées à des stratégies individuelles; suivies de la sensibilisation individuelle par des éducateurs sanitaires profanes; les lettres d'invitation venaient en dernier. Treize études de qualité moyenne ou excellente évaluaient des stratégies entraînant des augmentations significatives des taux d'utilisation du test de Papanicolaou et d'autres résultats.

Conclusions : Les stratégies les plus fructueuses semblent être celles qui combinent les campagnes dans les mass-média à des méthodes de sensibilisation directe des femmes et/ou des prestataires de soins de santé. Nous soulignons l'importance d'avoir des bases de données cytologiques précises et centralisées pour les rappels.

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Coming Events / Activités à venir

To be assured of publication in the next issue, announcements should be received by **October 1, 2002** and valid as of **December 31, 2002**. Announcements received after **October 1, 2002** will be inserted as time and space permit.

Pour être publiés dans le prochain numéro, les avis doivent parvenir à la rédaction avant le 1^{er} octobre 2002 et être valables à compter du 31 décembre 2002. Les avis reçus après le 1^{er} octobre 2002 seront insérés si le temps et l'espace le permettent.

Canada's Nursing Crisis: Emerging Trends and Opportunities
Co-hosted by the College of Licensed Practical Nurses of Manitoba and the College of Licensed Practical Nurses of Alberta
12-13 September 2002 Winnipeg, MB
Contact: Pat MacDonald (CLPNM)
Tel: 204-663-1212 Fax: 204-663-1207
E-mail: pmacdonald@clpnm.ca
www.canadanursingconference.com

Measuring Environmental Impacts on Health
10th Annual Association of Public Health Epidemiologists of Ontario (APHEO) Conference
29 September - 1 October 2002 Oakwood Inn Resort and Golf, Grand Bend, ON
Contact: confersense planners inc.
Tel: 613-232-4414 Fax: 613-232-0120
Toll-Free: 1-866-492-1171
E-mail: info@confersense.ca
www.confersense.ca

Ethical Challenges Across the Lifespan
14th Annual Canadian Bioethics Society Conference
17-20 October 2002 Victoria, BC
Contact: Veronica Morris
Tel: 250-519-7072 E-mail: cbs@uvic.ca

Health Research in Rural and Remote Canada: Meeting Challenges, Creating Opportunities
Third National Conference
Sponsored by Canadian Rural Health Research Society
24-26 October 2002 Halifax, NS
Contact: Sueli de Freitas, Secretariat
Tel: 306-966-7888 Fax: 306-966-8378
E-mail: bizetto@sask.usask.ca

Canadian Cardiovascular Congress 2002
Canadian Cardiovascular Society and Heart and Stroke Foundation of Canada
26-30 October 2002 Edmonton, AB
Contact: Heather Rourke
Heart and Stroke Foundation of Canada
Tel: 613-569-4361, ext. 318
E-mail: hrourke@hsf.ca
or
Tel: 613-238-2304 Fax: 613-236-2727
Toll Free: 866-317-8461
E-mail: ccc2002@intertaskconferences.com
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Poverty, Health & Equity: From Global Challenges to Innovative Solutions
Canadian Society for International Health
27-30 October 2002 Ottawa, ON
Contact:
conference@csih.org
Tel: 613-241-5785, ext. 313

70th Conjoint Meeting on Infectious Diseases
Canadian Association for Clinical Microbiology and Infectious Diseases, in association with Cdn Soc for International Health (affiliated with CPHA), Cdn Assoc of

Medical Microbiologists, and The Cdn Infectious Disease Society
3-6 November 2002 Halifax, NS

Vaccine Preparations and Vaccination Through Understanding Pathogenesis
UBC Stanier Symposium 2002
22 November 2002 Vancouver, BC
Contact: Stanier Institute
c/o A.S.A.P. Management Services
Tel: 613-723-7233 Fax: 613-723-8792
E-mail: asap@istar.ca

Maximum Impact: Home Care's Role in Healthcare Reform
12th National Canadian Home Care Association Conference
22-23 November 2002 Vancouver, BC
Contact: CHCA Conference Office
Tel: 604-681-2153
E-mail: CHCA@meet-ics.com
www.cdnhomecare.on.ca

Social Determinants of Health Across the Life Span: Canadian Perspectives
School of Health Policy and Management at York University and the Centre for Social Justice
28-29 November 2002 Toronto, ON

Expanding the Horizon: Taking Action Through Partnerships
National Conference on Women, Sport and Physical Activity
The Canadian Association for the Advancement of Women and Sport and Physical Activity (CAAWS)
28 November - 1 December 2002 Hamilton, ON
Contact: Paty Rutenberg
Conference Coordinator, CAAWS
Tel: 613-562-5667 Fax: 613-562-5668
E-mail: prutenberg@caaws.ca
www.caaws.ca

Science & Policy in Action
3rd National Conference on Tobacco or Health
The Canadian Council for Tobacco Control and Health Canada
1-4 December 2002 Ottawa, ON
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Département des conférences de l'ACSP
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3rd World Congress & Exposition
Sponsored by: B.C.'s Children's Hospital Foundation; University of British Columbia; and Canadian Institute of Health Research, Institute of Human Development, Child and Youth Health
11-14 May 2003 Vancouver, BC
Contact: Child & Youth Health 2003
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