31 August 1988 49-600

MEMORANDUM TO: S. Hirst/R. Lovell

c.c. D. Reading

FROM: Nigel Gray

==========

The recommendations on screening interval for cervical cancer are not going to be very easy to implement. Relevant items:

1. The Consensus Conference did not really achieve a consensus.

2. The outcome has been endorsed by the ACCV Executive Committee and will hopefully be endorsed by the VCOG.

3. One element of the agreed guidelines was impractical i.e. the statement that screening should begin at **18 years** regardless of sexual activity. The consensus group believed that sexual activity should not be mentioned. In a practical sense this means we are recommending cervical cytology for virgins which is probably unacceptable.

   The solution to this particular component of the guidelines lies in establishment of our own public education policy. i.e. We need to ameliorate the dogmatism of the starting time in our literature.

4. We have to face the fact that the gynaecologists will continue to recommend and perform annual screening on their selected population.

5. The Anti-Cancer Council's view ought formally to be, (and so far is), that we are looking for screening every three years. Our education program might have to take the view that we can't afford to use gynaecologists who disagree with us as part of our public education program.

6. Given that we endorse everything except the starting time in the National Guidelines, we nevertheless have to establish our own **priorities.**

   My priority group is women over forty who have never been screened in their lives. We do not come into conflict with the guidelines if we set this as our prime target group and spend all our money on campaigns aimed at this target group. I remain of the view that three yearly screening is a sensible thing for normal middle class people who have their own doctor and are willing to be screened regularly. The amount of emphasis we put on this middle class population as priority target is a matter for our own Victorian decision.

Sheila - this is really a discussion started

N. G.

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB, BS, Hon. LL.D. FRACP, FRACMA

Anti-Cancer Council of Victoria

18 August 1988

49-570

Mr D.C. MacDougal
9 Yamala Drive
Frankston 3199

Dear David,

Thanks for your note of August 9 about the report on Channel 2 relating to Herb Green's awful cervical cancer study in New Zealand. I've seen the tape and am pretty familiar with the story as it's been running on like blue hills for over a decade.

Judy had seen the program advertised and arranged that Robin should see it and that all calls arising from it should be put through to him. To everybody's surprise we didn't get a single call.

I don't imagine that anyone else could be so obtuse as Herbert Green and I don't believe any modern scientific committee would let this sort of thing slip through. The whole structure failed.

However, clinical trials as practiced in 1988 are an extremely sensitive area which require careful supervision. It is essential that people don't start a clinical trial and then lose interest and go away and forget it (as Herb Green chose to do) as these things cannot simply be dropped without creation of a situation which is adverse for the patients involved in the trial.

In summary, the VCOG has developed the guideline that once a trial has started it has to be completed unless there are very specific reasons as to why it should not be e.g. an early outcome or an obvious result.

However, the more common reason for a clinical trial of drug treatment in cancer patients to fail is lack of accrual due to lack of support from the local practitioners. We do have procedures for sorting this type of thing out and if a trial is not accruing patients at a satisfactory level we take it before the appropriate committee and cancel it. We have done this once or twice.

I think you would find it rewarding to sit down with Dick Lovell for half an hour on this topic - he's a mine of information and is, of course, Chairman of the NH&MRC Ethics Committee. I'm sure he'd be very happy to talk to you. I think you'd find his comments reassuring, I say this because his presence in the building is one of the reasons that our controls are carefully thought through.

I'll send his a copy so that he is prepared to hear from you.

Cheers.

Yours sincerely,

Nigel Gray
Director

c.c. Prof. R. Lovell

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: ACCV AA 34158

9 YAMALA DRIVE
FRANKSTON 3199
VICTORIA

9 Aug 1988

Dear Nigel,

No doubt you saw the Couchman Report on Channel 2 last night dealing with Prof Green Cervical Cancer Study at the Auckland Hospital.

I first heard about these rumblings in the early 70's when I was on a Committee at Massey University which was studying the effects of the use of Formaldehyde in Stock feed on animal and human health - and the whole Auckland Hospital study was being loudly criticised (we had Prof John Hunter of Otago on our committee + another Doctor) - so the programme content was not new to us.

You also would doubtless have been aware of the trials as would other members of the Executive and I am sure we will now get a number of people asking the fairly obvious questions - Could such a thing happen in Victoria? - Are our procedures when carrying out our Annual Audit of Funded Research Programmes sufficient to flush out this sort of problem? - would we try to sweep such a matter under the carpet as the Auckland Hospital thought they had done in 1976 -? Tough questions but ones we may have to face during the next few days.

There may well be built into our Research System the kind of checks that may be necessary - I hope these are + I hope we can say publically + frankly what they are if we are asked.

I know you always like me to be frank

Sincerely
David

Cervical Cancer

1 29-7-88

Policy Questions

NTh. to Talk

e.g.

1. ? Screen 10 ? x 4 annually
2. ? Screen 250 000 x 4 approximately
3. ? Screen whoever will accept — anyone —
4. Aggressively screen them — needs a central Register

It is one thing to set, say, 2 years. It's another to expect to achieve it. It's another to put the resources behind it.

We may do better to put resources into the 250 000 v4 group ē ethnic programmes etc @ $10/head, or even a bounty on the fee for service

IIe. Even if we do agree to

set a defined interval for
mass consumption, what
we might DO is something
different e.g. we could have
a mass website & do a campaign
over 2 years. But a massive
campaign aimed at the 200 000 x4

In another sense - this is
no big deal. We're setting the
optimum. Only 20-30% will
comply with the optimum.
It may be the 10% who never
comply that we put our
resources into.

Cancer of the Cervix

Proposed Consensus Conference on Screening Interval

One day meeting in Melbourne, August 1988

Introduction.

Assumption is that Ca. cervix is a numerically important and preventable cancer and that population screening is feasible and desireable . Discussion generally centres on :

1. Setting the pick-up rate expected by the community of women at large, women's groups and health professionals.
2. Feasibility, including public acceptance and education, recruitment, screening interval, resources for screening and recall, and facilities.
3. Resources and manpower for adequate management of detected lesions.
4. Ideal method or methods of delivery of program.
5. Cost
6. Evaluation

AIM

Discussion to arrive at agreed screening interval for all women or special intervals for specific groups of women. This first exercise should be to resolve the issue only in terms of the ideal based on epidemiology, pathology and ethics. Once this is determined it should be independently costed in different frameworks of health care delivery and then if the need arises, modified at a separate conference.

TOPICS FOR DISCUSSION

1. The moral responsibility of the screeners to detect cancer. All?, or what percentage? What are the standards? What are the expectations of an ideal program? Is the level of responsibility to detect different in a dedicated screening clinic to a doctor's surgery?

Discuss this from different perspectives

a. Women in general,the screenees
b. General practitioners
c. Specialist gynaecologists
d. Single purpose screening clinic

What are the medico-legal responsibilities of screening?

Cervical Summit

2. The facts ; the epidemiology of cancer of the cervix and premalignant conditions in Australia.

a. Actual numbers as well as incidence in various age groups and ethnic population groups.

b. Expected changes and trends.

c. What do studies of Victorian Cytology Service reveal?

d. Facts about progression to cancer and resolution of untreated premalignant lesions.

e. What is the size of the potential population to be screened?

3. Basis for intervals in established overseas programs

4. Screening interval.

a. Should there be one interval for all, or should there be different protocols for specific subgroups of women? Does it depend on age, pathology of initial smears, sexual behaviour?

b. What difficulties would choice of multiple protocols place on public and professional education?

c. If for reasons of cost it is too expensive to screen every woman frequently from beginning of sexual activity, is it feasible to choose a few particular ages on which to target major education and recruiting campaigns and expect to pick up the majority of cases? Would this be ethical?

d. When should screening stop?

e. Is there a case for special broader based clinics for the younger sexually promiscuous women, if such were feasible, and then start cervical cancer screening alone at a later age for all women?

Minutes of Meeting, 26 July 1988

Present NJG, DH, SN, SH, RM

Discussion topic **New Screening Interval Recommendation for Cancer of the Cervix**

Discussions were held on the actions required as a result of the new recommendations following the Consensus Conference on Cervical Cancer Screening at ACCV on 22 July 1988. It was agreed that these recommendations should be taken up by ACCV. However, it was also suggested that they need not necessarily be incorporated in the current program about to start on Monday 1 August. This program is directed at women aged over 40 years who have never had a smear and screening interval does not necessarily play a big part in this.

Elaine Henry from New South Wales Cancer Council had suggested that a combined research project between ACCV and New South Wales State Cancer Council should be offered to the gynaecologists to determine whether there is a subgroup of women who are developing rapidly invasive cancer at a young age. It was agreed that this would allay the anxieties of the gynaecologists about a longer screening interval. It was suggested that Graham Giles be spoken to concerning this project which was commented on by Bruce Armstrong. A second recommendation was that a copy of the report of the conference be sent to the VCOG with a letter stating:

1. That the consensus meeting comprised of representatives from all areas related to cervical cancer screening had agreed on the following recommendations;

2. That unless powerful reasons for not following these recommendations were forthcoming, we would be adopting the recommendations and proceeding to develop strategies for implementing them;

3. We wondered whether they had any comments to make.

Discussions then centred on Victorian priorities for continuing screening to prevent cervical cancer in the future. It was suggested that the following sequence should occur:-

1. That initially we continue to recruit the never screened older women;

2. That we target 30-40 year old women to have at least two smears separated by one year. These women would be approached through such networks as infant welfare centres, kindergartens, and family planning clinics. In this way we would select out the high risk group from the 30-40 year olds who would require close scrutiny and follow up for life;

3. The next group would be 40-65 year olds who would be obtained through their family practitioners and by public campaigns;

4. Finally we would try and reach the 18-30 year olds if necessary.

DPM-M-04

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB. BS. Hon. LL.D. FRACP, FRACMA

Anti-Cancer Council of Victoria

27 July 1988

49-536

Dr. H. Mitchell
Victorian Cytotology (Gynaecology) Service
Prince Henry's Hospital
St. Kilda Road
Melbourne 3004

Dear Heather,

I enjoyed your paper at the Cervical Summit. Even the gynaecologists would have had to concede that there was evidence of a great deal of careful thought and work.

In a country that's been virtually devoid of data for such a long time, your contribution met a need!

Cheers.

Yours sincerely,

Nigel Gray
Director

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: ACCV AA 34158

AUSTRALIAN CANCER SOCIETY INC.
A & C Building, 500 George Street, Sydney. Telephone (02) 267 1944
GPO Box 4708, Sydney, NSW. 2001. Australia. FAX: (02) 261 4123
Telex: AA 71036. Telegraphic address: Austcancer Sydney

Patron: His Excellency the Right Honorable Sir Ninian Stephen, AK, GCMG, GCVO, KBE.

BIII/5.2

8 JUL 1988

5 July, 1988.

Dr Nigel Gray
Anti-Cancer Council of Vic
1 Rathdowne Street
Carlton
VIC 3053

You have been nominated to attend the Consensus Conference on Screening Recommendations for Cancer of the Cervix to be held in the Conference Room, 1st Floor, Anti-Cancer Council of Victoria, 1 Rathdowne Street, Carlton, Victoria on Friday 22nd July, 1988, commencing at 8.45 am. noted.

Enclosed is the program for the meeting which also sets out the objectives of the discussions. A discussion paper, "The Screening Interval for the Prevention of Cervical Cancer", prepared by Dr Heather Mitchell and others is also enclosed.

For Interstate delegates

|__| Enclosed is an economy class return ticket for your travel to Melbourne. You may, if you wish, change the flight bookings by contacting your local Ansett representative.

|__| Accommodation has been reserved for you at the Rathdowne Motel/Downtown Motel (Tariff $78/$75), arriving 21 July, departing 22nd July, 1988. If this is not suitable, would you please contact Karen on (02) 2671944. You are responsible for paying your accommodation expenses.

Claim forms will be available at the meeting for expenses involved in your attendance. The allowance for overnight travel is $120.

The Australian Cancer Society acknowledges with thanks, the grant made by the Minister for Community Services and Health towards the cost of holding this meeting.

L.A. Wright,
Executive Director.

encl.

AUSTRALIAN CANCER SOCIETY

Cancer of the Cervix

CONSENSUS CONFERENCE ON SCREENING RECOMMENDATIONS

Anti-Cancer Council of Victoria

Melbourne, Friday, July 22, 1988 - 8.45 am - 4.00 pm

Thursday night fly-in and block booking at Rathdowne Motel/Downtown Motel

Assumption is that cancer of the cervix is a numerically important and preventable cancer and that population screening with the Pap. smear is feasible and desirable.

AIM

To arrive at agreed screening recommendations for all women, or specific recommendations for subgroups of women for the guidance of all contributing bodies.

To resolve the issue in practical terms based on edpidemiology, pathology, practicality, ethics and cost.

(What should be done with detected lesions is a separate issue)

PROGRAM

1. INTRODUCTION

The expected outcome of a screening program is prevention of cancer by detection of premalignant lesions, or an observed reduction in mortality from the target cancer in the screened population, not simply case detection.

8.45 am Chairperson - Mr Brian Fleming 10 min.

2. THE FACTS

The Epidemiology of cancer of the cervix and premalignant conditions in Australia.

Actual numbers as well as incidence in various age and ethnic population groups.

Trends and expected changes. What is the size of the potential population to be screened? Basis for intervals in established overseas programs.

Facts about progression to cancer and resolution of untreated premalignant lesions. Relationship to epidemiology of wart virus infection. Will early detection of the aggressive cancer in young women lower the mortality in this group? What do studies of the Victorian Cytology Service reveal?

8.55* Prof. Bruce Armstrong "Epidemiology" 20 min.

9.15 Dr Robert Rome "The Natural History of Cervical Intraepithelial Neoplasia and Wart Virus Atypia" 15 min.

9.30* Dr Heather Mitchell "Deductions from a review of the Victorian Cytology (Gynaecology) Service" 30 min.
(* A joint paper to be circulated before the meeting)

10.00 Discussion - Interpretation of Facts 10 min.

3. RECOMMENDATION

At this stage, from the facts presented, the epidemiologists will be asked to make their recommendations as a basis of discussion for the rest of the conference.

10.00 Prof. Bruce Armstrong 5 min.

10.05 - 10.30 a.m. COFFEE BREAK

4. RESPONSIBILITY

What is the moral responsibility of the screeners to detect all premalignant lesions and/or cancers? What should be the standards and expectations of the community and the public health authorities; that every cancer be prevented, or the great majority? Does the level of responsibliity to detect differ between dedicated screening clinics dealing with a population and the doctor's surgery when an individual women requests a health check? Should doctors be responsible for initiating the checks?

10.30 Ms Margaret Peters "Womens' Expectations" 10 min.

10.40 Dr Robin Marks "Cancer Public Educators View" 10 min.

5. SCREENING RECOMMENDATIONS

Should there be one interval for all, or should there be different protocols for specific subgroups of women? Does it depend on age, pathology of initial smears, sexual behaviour?

What difficulties would the choice of multiple protocols place on public and professional education?

If for reasons of cost it is too expensive to screen every womam frequently from beginning of sexual activitiy, is it feasible to choose a few particular ages on which to target major education and recruiting campaigns and expect to pick up the majority of cases? Would this be ethical?

When should screening start and stop?

Is there a case for special broader based approach for the younger sexually promiscuous women, if such were feasible, and then start cervical cancer screening alone at a later age for all women?

What are the obstacles to performance of Pap smears in routine practice and to recruitment to screening programs?

Speakers to address appropriate aspects of these topics:

10.50	Dr Malcolm Coppleson (Gynaecologist)	15 min.
11.10	Prof. Robert Sanson-Fisher (Behavioural Scientist)	15 min.
11.30	Mrs Elaine Henry (Director, NSW Cancer Council)	15 min.
11.50	Dr Chris Brown (General Practitioner)	15 min.
12.10	Mr Rob Carter (Health Economist, AIH)	15 min.

(Times allow for 5 min. of question of fact after each speaker)

12.30 - 1.30 LUNCH

It is intended to appoint a Consensus Panel to draw the final conclusions from the meeting. The Chairperson of the Panel will present their recommendations. Panel to meet over lunch (at ACCV) for preliminary discussion.

Discussion Paper by NG

Panel Members:

Mrs Elaine Henry	ACS (Chairperson)
Dr Keith Free	RACOG
Dr Margaret Davy	RACOG
Mrs Margaret Peters	NH&MRC
Dr Judith Lumley	Epidemiologist
Dr Gabriele Medley	Pathologist
Dr David Hill	Behavioural Scientist
Ms Jude Abbs	Consumers Health Forum

1.30 - 3.15 DISCUSSION FROM THE FLOOR

When invitations are extended, individual invitees and organisations will be offered the opportunity to submit brief prepared comments for inclusion in the final program, or for tabling at the meeting at the organiser's discretion.

1.30 Discussion opener - Dr Nigel Gray "Should Cervix Screening be Considered in Isolation".

3.15 - 3.30 COFFEE BREAK

Consensus Panel to prepare final recommendations

CONCLUSIONS

3.30 Chairperson of Consensus Panel

4.00 Meeting concludes.

Recommendations to be forwarded particularly to AHMAC, NH&MRC, State and Territory Cancer Councils, Commonwealth and State Health Depts. as well as contributing bodies.

THE SCREENING INTERVAL FOR THE PREVENTION OF CERVICAL CANCER

Heather Mitchell
Epidemiologist
Victorian Cytology (Gynaecological) Service
Melbourne

with assistance from

Bruce Armstrong
Director & Professor of Epidemiology & Cancer Research
NHMRC Research Unit in Epidemiology & Preventive Medicine
Perth

Rob Carter
Economist
Australian Institute of Health
Canberra

Paul McCann
Principal Medical Officer
Health Benefits Division
Commonwealth Department of Community Services & Health
Canberra

1 PURPOSE OF THIS DOCUMENT

A Consensus Conference on the recommended interval between Pap smears for the prevention of cancer of the cervix is to be held in Melbourne on 22 July 1988. The conference is being organised by the Australian Cancer Society with financial support from the Commonwealth Department of Community Services and Health. This document has been compiled to assist the invited participants and the consensus panel.

A cost effectiveness approach in relation to a variety of screening intervals is outlined, based on the natural history of cervical cancer in Australia in the 1980s. It is emphasised that the purpose of this analysis is not to place an arbitrary value on a woman's life. Rather in a time of economic restraint, a cost effectiveness approach has been used to explore how community resources can best be utilised to gain health benefits. As the interval between screens is reduced the benefits in terms of lives saved will increase but at a cost. This analysis will quantify these benefits and costs to enable informed judgements to be made on the interval. As an illustration of an alternative use of the resources, a costing of mammographic screening for breast cancer is also included in this paper.

As much of the data on which a cost effectiveness analysis relies can only ever be best estimates of the "truth", a sensitivity analysis has been provided to show the variation in costs and benefits with high and low estimates of critical variables.

While it is recognised that Pap smear screening in Australia could be altered in many ways (eg. call and recall of all "at risk" women at regular intervals, dedicated "well women" clinics, the use of nurse practitioners to take smears), this analysis has focused on the working practices and delivery systems currently operating in Australia.

2 CANCER OF THE CERVIX IN AUSTRALIA

2.1 LIFETIME RISK OF CANCER OF THE CERVIX

From the 1982 incidence rates for cervical cancer in Australia, it has been estimated that each Australian woman has a one in 93 chance of developing cervical cancer up to the age of 65 years (1). In the absence of any screening, it has been estimated that the risk to a woman would be one in 64 for the age range 20-64 years (2). The probability of an Australian woman dying of cervical cancer before 75 years of age is currently one in 250 (1).

These lifetime probabilities are small. Cancer of the cervix is not a major disease of women. Its importance derives from the fact that it is one of a small number of substantially preventable cancers. In addition, in comparison to some other cancers, it affects a younger group of women, so its personal and social impact is relatively high.

2.2 INCIDENCE

Screening for cervical cancer has been available to Australian women since the mid 1960s, but each year 350 women die from this cancer and almost 1000 women are diagnosed with invasive disease. Incidence rates of cervical cancer Australia for 1982 show a steady increase from 20-35 years, and thereafter a more or less constant rate (Table 1) (1). The disease is rare under 20 years of age; no cases of invasive cancer of the cervix were reported in Australia in 1982 in teenagers - 1982 is the only year for which we have published national incidence statistics.

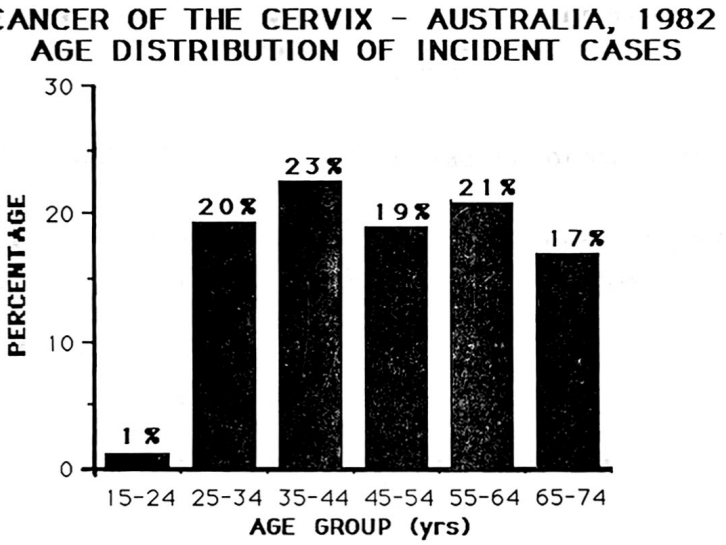
TABLE 1: INCIDENCE RATES FOR CERVICAL CANCER - AUSTRALIA, 1982

AGE GROUP	INCIDENCE RATE (per 100,000 women)
20-24 yrs	1.5
25-29 yrs	10.8
30-34 yrs	17.0
35-39 yrs	20.9
40-44 yrs	20.8
45-49 yrs	19.8
50-54 yrs	24.6
55-59 yrs	24.5
60-64 yrs	27.7
65-69 yrs	34.2
70-74 yrs	20.4
75-79 yrs	21.2
>79 yrs	23.1

These published rates underestimate the true rates for age groups where a significant proportion of the population have had a hysterectomy and are therefore no longer "at risk" of cervical cancer.

While the highest incidence rates for cervical cancer are in women aged 65-69 years, the greatest number of cases occurs in the age group 35-39 years. This is because the lower incidence rates for the age group 35-39 years are applied to a larger number of women than are the higher incidence rates for the 65-69 year age group. Figure 1 shows the proportionate distribution of new diagnoses of cervical cancer by age group in Australia in 1982. One hundred and eighty cases of cervical cancer were registered in women aged less than 35 years, representing 22% of the cancers diagnosed in women between 20 and 70 years of age.

FIGURE 1: AGE DISTRIBUTION OF INCIDENT CASES OF CANCER OF THE CERVIX, AUSTRALIA 1982



Incidence rates for precursor lesions are not recorded by most Australian Cancer Registries. It is generally believed that three to four times as many women will be diagnosed with carcinoma in situ as with invasive cancer, with a younger age distribution for the carcinoma in situ cases. During 1977-1984, 593 cases of invasive cancer were reported in South Australia compared to 1673 cases of carcinoma in situ, giving a ratio of 1:2.8.

From 1984 carcinoma in situ incidence rates for South Australia, 2,236 cases of carcinoma in situ could be expected each year in Australia in women aged 15-34 years (3). Some cases of carcinoma in situ do occur in teenagers, particularly those in the later teenage years. We lack information on the number of years these teenagers had been sexually active.

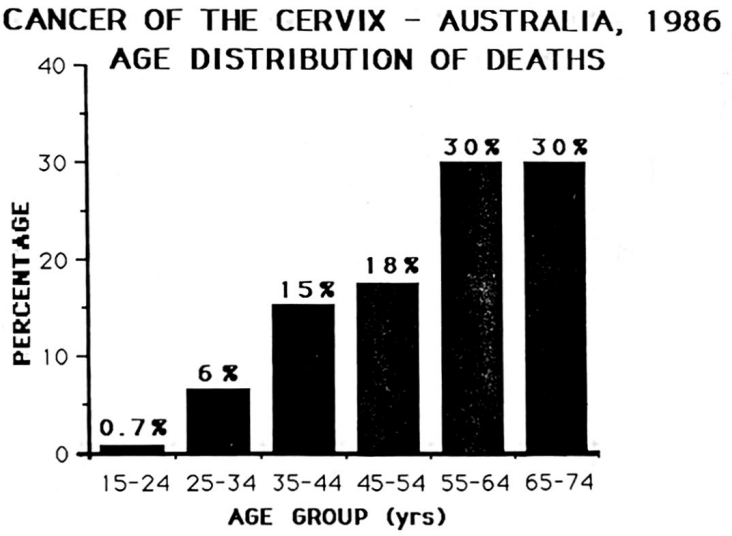
Carcinoma in situ is a curable condition. Some women who have completed their families chose to have it treated by a hysterectomy. Alternatively it can be treated locally, in such a way that future child-bearing is still possible. It is believed that only a proportion (approximately one third) of carcinoma in situ cases would progress to invasive cancer in the absence of any treatment.

2.3 MORTALITY

The age distribution of the 350 women who died from cervical cancer in 1986 shows that the greatest proportion of deaths occurred in women aged 60-69 years. See Figure 2.

Twenty deaths occurred in women aged less than 35 years, representing 5.7% of all deaths from cancer of the cervix or 7.1% of the deaths from cervical cancer in women aged less than 75 years.

FIGURE 2: AGE DISTRIBUTION OF DEATHS FROM CERVICAL CANCER, AUSTRALIA 1986



2.4 CHARACTERISTICS OF THE WOMEN WHO DIED FROM CANCER OF THE CERVIX DURING 1986 IN AUSTRALIA

Additional demographic details on the 350 women who died from cervical cancer during 1986 have been made available by the Australian Bureau of Statistics. While the usefulness of the following tables is limited by the lack of comparable data for all women in the community, the tables do show the profile of the Australian women who are dying from cervical cancer.

2.4.1 MARITAL STATUS AT TIME OF DEATH

Information on marital status at time of death was available for 348 women. The following profile was given:

Never married	5%
Married	48%
Widowed	37%
Divorced	10%

2.4.2 AGE AT FIRST MARRIAGE

Information on the age at first marriage was given for 88% of the women who had ever been married (290/329). The profile of age at marriage was:

15-19 years	29%
20-24 years	46%
25-29 years	16%
30-34 years	6%
35-49 years	3%

2.4.3 COUNTRY OF BIRTH AND PERIOD OF RESIDENCE IF NOT BORN IN AUSTRALIA

Australia	70%
United Kingdom	14%
Other European countries	12%
Asia, Africa	2%
USA, NZ	1%
Other	1%

During 1986, 75% of deaths from all causes occurred among persons who were born in Australia and 25% among persons born outside of Australia. Deaths from cancer of the cervix therefore appear to disproportionately affect persons born outside of Australia.

Information was available on the period of residence for 94 of the 107 women born outside of Australia. Eighty six of these 94 women had been resident in Australia for more than 10 years. This indicates that many of the women who had been born overseas and who died from cervical cancer had probably lived in Australia for a sufficient period of time to participate in a cervical cancer screening programme.

2.4.4 AREA OF RESIDENCE

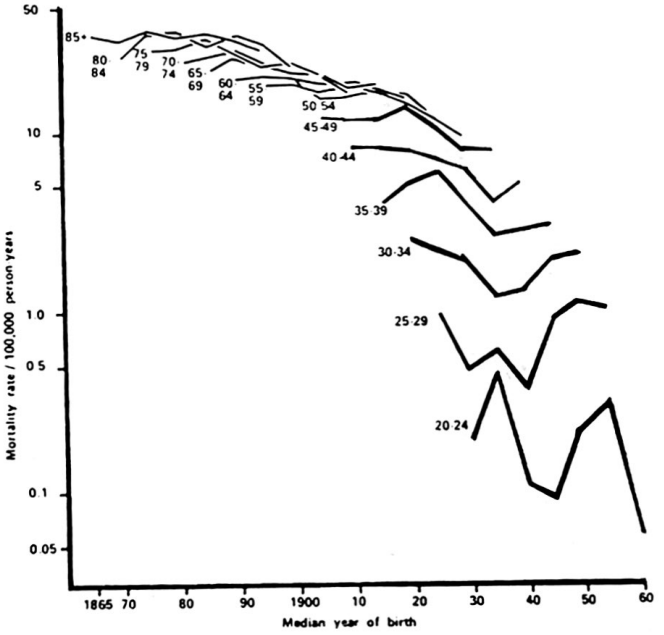
Three hundred and forty two of the deaths occurred in the States of Australia and 8 in the Territories (NT, ACT). Thirty six percent of the deaths in the States were among women who were resident outside of the capital cities. This compares well with 1986 census data where 37% of females were registered as living outside capital cities. No excess of deaths from cervical cancer appears to be occurring in rural areas.

2.5 TRENDS IN INCIDENCE AND MORTALITY OVER TIME

2.5.1 TRENDS IN MORTALITY

While overall mortality from cancer of the cervix has fallen steadily since it was separated from other cancers of the uterus in mortality statistics in 1950, evidence that it has been increasing recently in younger women has been a matter of concern (4,5). Figure 3 shows that, after adjustment for the estimated proportion of women who had had a hysterectomy in each age group, mortality continued to fall steadily up to 1980-84 in women over 45 years of age, but showed evidence of recent rises under this age. However, mortality had stopped rising, and may even have fallen, in women under 30 years of age in the most recent time period.

FIGURE 3: TRENDS IN MORTALITY FROM CANCER OF THE CERVIX, AUSTRALIA 1950-1984 (Adjusted by estimates of the number of women in each age group in each year who had had a hysterectomy).



Trends are shown by year of birth rather than year of death, but the graph for each age group represents mortality from 1950-54 to 1980-84 (From reference 5)

Mortality data for 1975-79 and 1980-84, together with previously unpublished data for 1985-86, are shown in more detail in Table 2. These data show that, except in the age group 30-34 years, there were no further increases in mortality from cancer of the cervix in those under 45 years of age in 1985-86. Mortality continued to fall in those 45 to 54 years of age but, in those over 55 years of age, the long term trend towards lower mortality rates for cancer of the cervix appears to have come to an end.

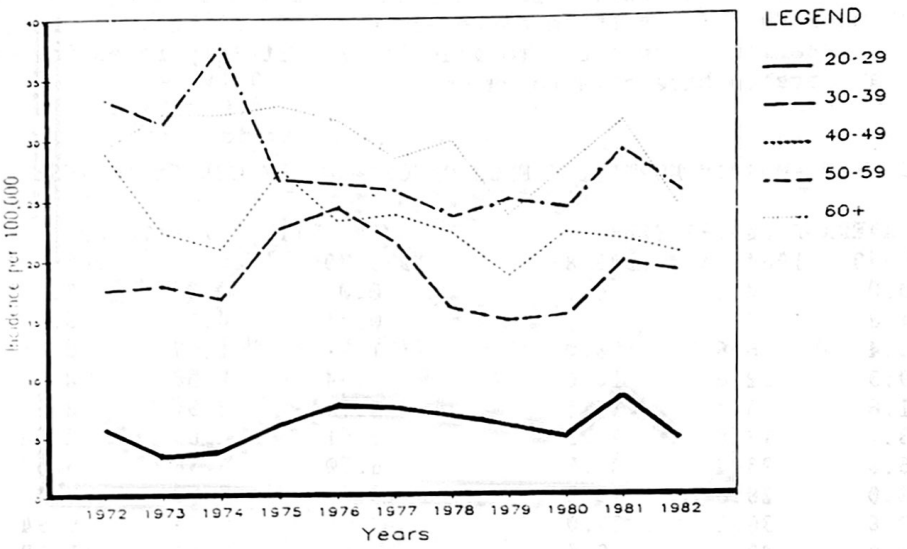
TABLE 2: RECENT TRENDS IN MORTALITY FROM CANCER OF THE CERVIX IN AUSTRALIA

	AVERAGE DEATHS/YEAR			MORTALITY RATE/100,000		
AGE	1975-79	1980-84	1985-86	1975-79	1980-84	1985-86
<20	0.0	0.0	0.0	0.0	0.0	0.0
20-24	1.8	0.4	1.0	0.31	0.06	0.15
25-29	6.4	6.6	6.0	1.11	1.07	0.91
30-34	9.3	12.6	16.0	1.94	2.08	2.54
35-39	11.6	15.4	16.5	2.78	2.94	2.69
40-44	13.4	19.8	22.5	3.61	4.69	4.64
45-49	25.0	23.4	22.5	6.70	6.36	5.57
50-54	38.0	28.0	25.5	10.07	7.52	7.10
55-59	42.6	36.2	37.0	12.66	9.73	9.94
60-64	46.8	42.6	42.0	15.59	12.84	11.48
65-69	40.8	46.0	52.0	16.04	15.98	17.44
70-74	37.6	34.8	38.5	19.44	14.88	14.74
75-79	32.0	30.6	26.5	22.48	18.84	14.16
80-84	25.8	22.6	25.0	28.24	20.79	21.38
>84	18.2	18.8	27.0	30.75	25.95	29.58
All	349.8	337.8	358.0	4.04	3.53	3.44

2.5.2 TRENDS IN INCIDENCE OF INVASIVE CANCER

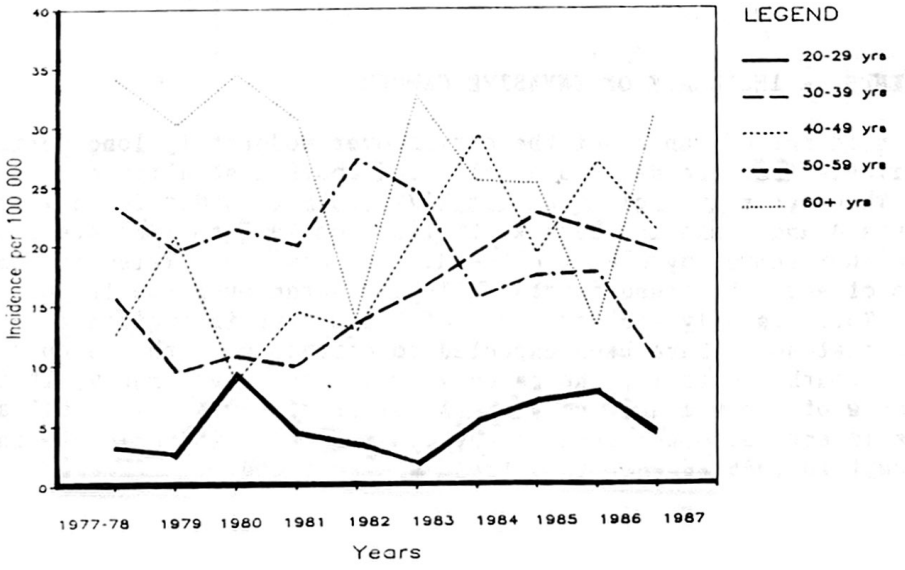
Data on the incidence of cancer of the cervix over moderately long periods of time are available from the New South Wales and South Australian cancer registries. The trends in incidence from 1972 to 1982 in New South Wales are shown in Figure 4 and those in South Australia from 1977 to 1987 are shown in Figure 5. Neither shows any dramatic trend. In New South Wales in women over 40 years of age, the trend is generally downwards over the 10 years of observation. There is only weak evidence of the upturn in incidence in younger women that would have been expected to correspond with the upturn in mortality. In South Australia, the rates vary irregularly largely, it is assumed, because of the comparatively small number of cases (91 in all ages in 1987). There is some evidence of a steady upwards trend in incidence in 30-39 year olds except in 1985-86 when this trend was reversed.

FIGURE 4: TRENDS IN INCIDENCE OF INVASIVE CANCER OF THE CERVIX, NEW SOUTH WALES 1972-82*



* Data from reports of the New South Wales Central Cancer Registry

FIGURE 5: TRENDS IN INCIDENCE OF INVASIVE CANCER OF THE CERVIX, SOUTH AUSTRALIA 1977-87*

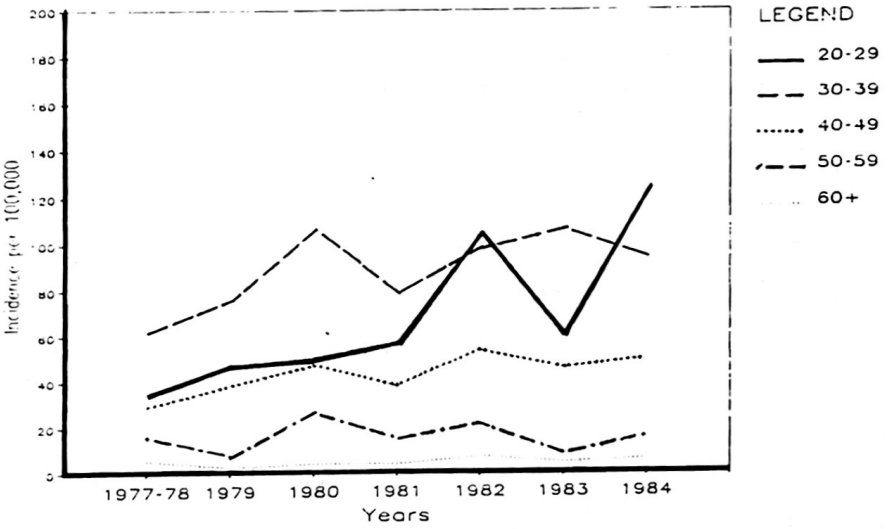


* Data taken from reports of the South Australian Cancer Registry. Unpublished data for 1987 kindly provided by Dr A Bonnet.

2.5.3 TRENDS IN CERVICAL INTRAEPITHELIAL NEOPLASIA

Trends in incidence of CIN 3 in South Australia from 1977 to 1984 (collection of data on CIN 3 lesions in South Australia stopped in 1984 as an economy measure) are shown in Figure 6. This figure suggests a steady increase in incidence of CIN 3 in those under 50 years of age which was steepest in those 20-29 years of age. These results are consistent with a report from a STD clinic in Western Australia which observed a three-fold increase in the prevalence of CIN in first attenders between 1978 and 1982 (6).

FIGURE 6: TRENDS IN INCIDENCE OF CARCINOMA-IN-SITU, SOUTH AUST, 1977-1984 (5)



It is possible to take these trends into a more recent time period by examining CIN 3 prevalence rates in women whose smears were reported by the Victorian Cytology (Gynaecological) Service (VCGS). Table 3 shows the trends over four time periods from 1970-74 to 1985-87. Only in women 25-34 years of age is there a consistent trend for the prevalence of CIN 3 to increase over the whole of the period covered. In most other age groups the prevalence proportions have fallen since the late 1970s.

TABLE 3: CIN 3 PREVALENCE BY AGE, VCGS 1970-87

	PREVALENCE OF CIN 3/1000 WOMEN SCREENED			
AGE	1970-74	1975-79	1980-84	1985-87
15-19	0.0	0.0	0.0	0.2
20-24	0.0	1.5	0.5	0.5
25-29	0.0	0.4	1.3	1.9
30-34	0.1	1.7	2.1	2.4
35-39	0.7	2.9	2.1	2.0
40-44	1.1	3.1	1.7	1.6
45-49	1.2	2.4	1.3	1.2
50-54	1.2	2.0	0.7	0.6
55-59	1.5	1.7	0.5	0.4
60-64	1.2	1.6	0.6	0.3
65-69	0.9	1.3	0.2	0.0

2.5.4 TRENDS IN INFECION OF THE CERVIX WITH HUMAN PAPILLOMAVIRUS

A recent analysis of trends in cytological evidence of human papillomavirus (HPV) infection of the cervix in teenagers whose smears were reported by the VCGS showed little evidence of an increase in prevalence over the period 1980-87 (7). For most of the period, the prevalence varied between 4% and 5%. Prevalence of CIN in association with HPV infection, however, increased over this period.

A report from a STD clinic in Western Australia also found little evidence of an increase in the prevalence of cytological evidence of HPV infection of the cervix in new attenders between 1978 and 1982 (6).

It may be of interest to note that the number of smears received by the VCGS from Victorian teenagers increased from a few hundred in each of 1980 and 1981, to nearly 3,000 in 1982, and 6,000 to 12,000 between 1983 and 1987. The increase began the year after a report of increasing mortality from carcinoma of the cervix in young women (4).

2.5.5 COMPARISON WITH SCANDINAVIAN COUNTRIES

It may be informative to compare trends in incidence of cervical cancer in Australia with those observed in Scandinavian countries under various policies of population screening. New South Wales incidence rates are similar to those of Sweden and Iceland, less than those of Norway and Denmark and more than those in Finland. While no very strict comparison can be made, it appears that the incidence in New South Wales was not falling in the late 1970s at as great a rate as incidence was falling in the Scandinavian countries.

The falls in Scandinavia have been attributed to population-wide screening with cervical cytology. The intervals between screens are 5 years in Finland, 4 years in Sweden, 2-3 years in Iceland, and 3-5 years in Denmark. Norway does not have organised population-wide screening and appears to have had less of a fall in incidence than the other Scandinavian countries (8).

2.5.6 COMMENT

The available evidence suggests that while mortality and probably incidence of invasive cancer of the cervix increased in young women in Australia in the late 1970s and early 1980s, further increases are not now occurring and the rates in young women may actually be falling. Incidence of CIN, however, may still be rising, particularly in women in their late 20s and early 30s, although trends in CIN are difficult to interpret because they may be produced artefactually by changes in the frequency of screening. Contrary to popular opinion, the prevalence of HPV infection in young women in Australia appears not to have increased appreciably over the past 10 years.

Given evidence of an increasing frequency of screening of young women in Australia in the early 1980s, it would seem reasonable to attribute the fall in mortality from cancer of the cervix in this age group to this change.

2.6 SURVIVAL OF WOMEN WITH CANCER OF THE CERVIX

Two types of survival statistics are commonly presented:

(1) Crude or Absolute Survival Rate - this refers to the proportion of patients who survive for a defined period of time from diagnosis

(2) Relative Survival Rate - this removes the influence of other unrelated causes of death from the crude survival rates

Relative survival rates are therefore higher than crude rates and are a better reflection of survival for the particular disease being studied. All survival rates used in this paper are relative.

2.6.1 SURVIVAL AT 5 YEARS

Five year relative survival rates for women diagnosed with cancer of the cervix in South Australia during 1977-1982 were 83% for women aged less than 50 years at diagnosis and 58% for women aged 50-69 years at diagnosis (9). While these figures suggest that survival varies dramatically with age at diagnosis, they do not take account of the stage of the cancer at diagnosis.

There is concern that if a more aggressive type of cancer is preferentially affecting younger women, their survival may be less than older women for the same stage of disease. A recent evaluation of 2870 English women with invasive cancer treated in the 1970s showed a better survival for women aged less than 35 years compared with women aged over 35 years when allowance was made for the stage at diagnosis (10). See Table 4.

TABLE 4: RELATIVE SURVIVAL AT 5 YEARS BY AGE AND STAGE OF CANCER, UK 1971-78

	RELATIVE SURVIVAL AT 5 YEARS	
	<35 YRS	>35 YRS
STAGE 1A	100%	96%
STAGE 1B	93%	79%
STAGE 2	62%	58%
STAGE 3	50%	34%
STAGE 4	20%	10%

The authors concluded from this analysis and a review of previous reports that age was a poor predictor of prognosis and that there was no evidence of an aggressive form of cervical cancer in younger women during the 1970s.

Similar results were found in a study of 385 patients treated between 1970 and 1984 at the Royal Marsden Hospital, Surrey, England (11).

2.6.2 SURVIVAL AT 15 YEARS

Survival at 5 years after a diagnosis of cancer is broadly equated with a cure. There is a paucity of published statistics for survival beyond 5 years, Norway being one of the few countries which has published survival rates for 15 years after diagnosis (12). These statistics show very little further decline in survival beyond 5 years for women aged up to 54 years at diagnosis, regardless of stage; however women aged 55-74 years continue to have a further decline in survival beyond 5 years. See Table 5.

TABLE 5: RELATIVE SURVIVAL BY AGE AND STAGE OF CANCER, NORWAY 1953-1967

		RELATIVE SURVIVAL AT 5 YRS	15 YRS
STAGE 1	20-44 yrs	0.84	0.80
	45-54 yrs	0.83	0.76
	55-74 yrs	0.82	0.63
STAGE 2	20-44 yrs	0.60	0.55
	45-54 yrs	0.60	0.52
	55-74 yrs	0.63	0.44
STAGE 3	20-44 yrs	0.30	0.26
	45-54 yrs	0.31	0.24
	55-74 yrs	0.38	0.27
STAGE 4	20-44 yrs	0.08	0.08
	45-54 yrs	0.11	0.12
	55-74 yrs	0.11	0.08

A review of 10,022 cases of invasive cervical cancer treated in the west Midlands during 1957-1981 confirmed the results of Table 5 in that up to 20 years after diagnosis, a young age had a small but significantly favourable influence on survival (13).

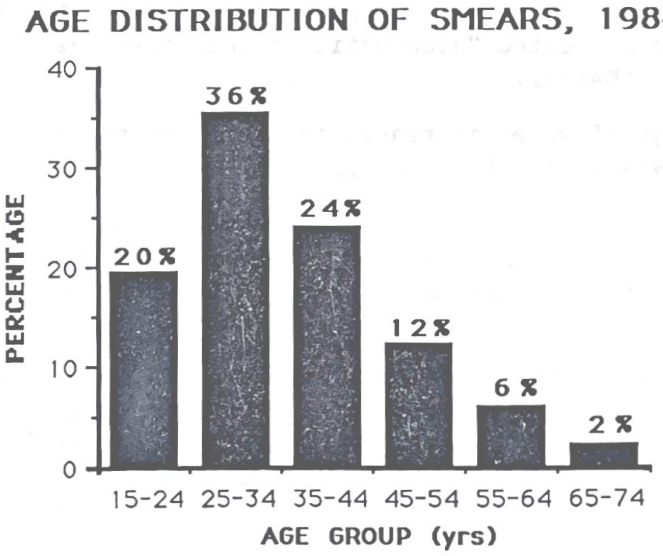
3 ACCEPTANCE OF SCREENING

3.1 AGE GROUP BEING SCREENED

Twenty five percent of Australian women aged 15-74 years had one or more Pap smears during the 1986/7 financial year. By confining the analysis to women aged 20-64 years the figure improves to 30%. These figures are derived from the number of Medicare claims for cervical cytology, the number of Pap smears reported in the two large public sector laboratories which do not bill Medicare ([VCGS] and Queensland Cytology Service), and adjusted for the number of women who have more than one smear taken in a 12 month period (an average of 93 women are screened for every 100 smears reported in a one year period) and the estimated proportion of women within each age group who have had a hysterectomy and are therefore no longer "at risk" of cervical cancer (5).

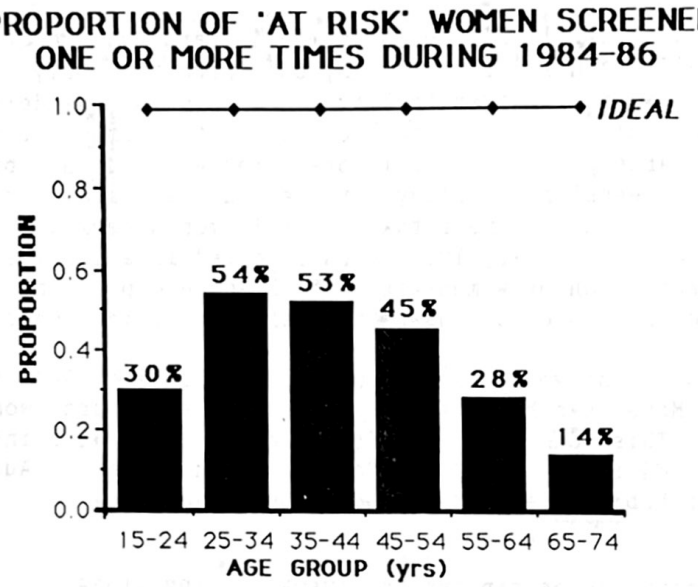
The age distribution of the women having smears taken during 1984-1986 is shown in Figure 7. More than half of the smears were taken from women aged less than 35 years. This tendency to lower screening rates with increasing age has been documented in Victoria, New South Wales and Western Australia (14,15,16) and is probably general throughout Australia.

FIGURE 7: AGE DISTRIBUTION OF PAP SMEARS, AUSTRALIA 1984-1986



It appears that half of all smears taken during 1984-1986 were repeated smears from women who had already been screened during the interval. When allowance is made for this rescreening it appears that during 1984-87, only 40% of "at risk" women aged 15-74 years were screened. The proportion varies with the age of the woman, being highest at 54% in women aged 25-44 years, and declining to 14% in women aged 65-74 years. See Figure 8. These figures indicate that 60%, or more than half of the "at risk" Australian population, were unscreened in a recent 3 year period.

FIGURE 8: PROPORTION OF "AT RISK" WOMEN SCREENED ONE OR MORE TIMES DURING 1984-1986



Data are not available on the number of smears taken within public hospitals, but many of these would be repeated "diagnostic" smears taken as part of management of a known abnormality.

It appears that as the age of women increases in Australia so does the interval between Pap smears (15).

3.2 CYTOLOGY REPORTS IN WOMEN HAVING PAP SMEARS

Most Pap smears are reported as normal. Rates for infection with HPV and cervical intraepithelial neoplasia (CIN) appear to be higher in younger women; invasive cancer rates are higher in older women.

Table 6 shows the profile of cytology reports within the VCGS in 1986 by age group.

TABLE 6: DISTRIBUTION OF PAP SMEAR REPORTS BY AGE OF WOMAN, VCGS 1986

AGE	NORMAL/ BENIGN*	BENIGN**	HPV INFECTION	CIN 1 & 2	CIN 3	INVASIVE CANCER
15-19	94.3%	1.6%	1.00%	3.07%	0%	0%
20-24	93.5%	2.2%	0.97%	3.36%	0.05%	0.005%
25-29	94.6%	2.1%	0.54%	2.66%	0.15%	0.028%
30-34	95.8%	1.7%	0.35%	1.96%	0.20%	0.039%
35-39	96.4%	1.8%	0.25%	1.39%	0.16%	0.047%
40-44	97.0%	1.4%	0.24%	1.15%	0.16%	0.070%
45-49	97.2%	1.6%	0.21%	0.80%	0.16%	0.057%
50-54	96.8%	2.1%	0.18%	0.75%	0.06%	0.096%
55-59	97.1%	2.2%	0.14%	0.37%	0.03%	0.150%
60-64	96.6%	2.5%	0.09%	0.44%	0.03%	0.359%
65-69	97.2%	2.0%	0%	0.44%	0%	0.399%
70-74	96.6%	2.2%	0%	0.35%	0%	0.818%

* Benign abnormalities with the recommendation for repeat cytology in 12 months

** Benign abnormalities of a more serious type with a recommendation for either repeat cytology within the next 6 months or further investigation

The treatment of CIN lesions in young persons has been claimed to be preventing an epidemic of invasive cervical cancer. This may be true. However, with Pap smear screening regularly reaching at best only one half of the "at risk" Australian women in the younger age groups, the evidence of the epidemic in the unscreened one half of the population is not strong.

3.3 SMEAR HISTORY OF WOMEN WITH INVASIVE CANCER

Even if all "at risk" women in Australia were regularly screened some women would still develop cervical cancer of the squamous cell type; this is because the test is not 100% sensitive in detecting the precursor lesions to squamous cell carcinoma. The reasons for this less than 100% preventability are:

(1) sampling error - some lesions develop in areas of the cervix that are not able to be smeared; some accessible but invisible lesions are missed by the sample of cells which is taken.

(2) reporting error - the reporting of Pap smears involves a human interpretation of the microscopic appearance of cells. It is not currently possible to make this an "error-free" process.

(3) rapid onset cancers - these are cancers which grow rapidly, developing in the interval between smears. As far as can be ascertained the previous negative cytology report was accurate with an adequate sample of cells being taken. The cancer would appear to have developed in the time between smears.

Given that the smear test is not completely satisfactory in preventing cancer, it is still of interest to note the screening histories of the women with cancer, attempting to define the proportion of cases which have occurred despite an adequate screening history. It is emphasised that the ability to do work of this nature is seriously and increasingly hindered by the lack of centralised records of Pap smears.

Registrations of women with invasive cancer diagnosed in Victoria during 1982 and 1983 with the Victorian Cancer Registry are complete. The smear histories for the preceding 10 years of the women with squamous cell carcinoma have been compiled from within the VCGS records. For most of the decade 1972-1982, 90%-95% of all Pap smears taken in Victoria were reported by the VCGS.

The screening histories over the preceding 10 years for these women were grouped as adequate, inadequate, abnormal or nil as follows:

Adequate	4%	(defined as 3 or more negative or benign smear reports)
Inadequate	18%	(defined as less than 3 negative or benign smear reports)
Abnormal	4%	(defined as 1 or more significantly abnormal reports including HPV, CIN etc.)
Nil	75%	(defined as no smears received)

The proportions of women with nil or inadequate screening histories are probably overestimates as no account has been taken of smears examined in other laboratories. Also some women may have been screened under a different surname, but this was not thought likely to affect many of the women, the majority of whom were over 35 years at the time of diagnosis of cancer.

Despite these limitations the overwhelming reason why women are still being diagnosed in Victoria with invasive cancer appears to be that either no or an inadequate use has been made of screening in the preceding 10 years. Fewer than 5% of the women had a screening history that would meet the least frequent recommendations currently promoted in Australia.

4 RECOMMENDED SCREENING INTERVAL

4.1 RECOMMENDED SCREENING INTERVAL IN OVERSEAS COUNTRIES

A diversity of screening intervals is recommended in overseas countries. The following are some examples.

NEW ZEALAND (1985)
Two smears one year apart, then repeated at least every 3 years Starting as soon as possible after commencing sexual intercourse and ceasing at age 65 years (17)

USA (1988)
The following recommendation (or a similar one) has recently been endorsed by
- American Cancer Society
- National Cancer Institute
- American College of Obstetricians and Gynaecologists
- American Medical Association
- American Nurses Association
- American Academy of Family Practice
- American Medical Women's Association

"That all women who are, or who have been, sexually active, or have reached age 18 years, have an annual Pap test and pelvic examination. After a woman has had three or more consecutive satisfactory normal annual examinations, the Pap test may be performed less frequently at the discretion of her physician." (18)

CANADA (1982)
Annually aged 18-35 years, then every 5 years (19)

UK (1982) Department of Health and Social Security
Five yearly between 20-65 years, plus screening early in each pregnancy (20)

UK (1987) Working Party of Royal College of Obstetricians and Gynaecologists, Royal College of Pathologists, Royal College of General Practitioners, Faculty of Community Medicine
Three yearly between 20-64 years (21)

ICELAND (1985)
Two/three yearly between 25-70 years (22)

SWEDEN (1985)
Fourly yearly between 30-49 years (23)

4.2 RECOMMENDED SCREENING INTERVALS IN AUSTRALIA

Note: Some of the following recommendations are currently under review.

AUSTRALIAN CANCER SOCIETY
Annual until age 65 years (24)

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL OF AUSTRALIA
Two smears one year apart, then not more than 3 years between screens.
Commence within 3 years of sexual activity beginning,
Stop at 65 years if at least 2 smears and no abnormal smears in the preceding 10 years.

ROYAL AUSTRALIAN COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS
Two smears one year apart, then 2 yearly.
If high risk (eg.sexually promiscuous/previous abnormality) annual screens for life.

NEW SOUTH WALES CANCER COUNCIL/NEW SOUTH WALES HEALTH DEPARTMENT
Annual.

QUEENSLAND HEALTH DEPARTMENT
Annually till 35 years, then 3 yearly.

ANTI-CANCER COUNCIL OF VICTORIA
Two yearly.

FAMILY PLANNING FEDERATION OF AUSTRALIA
Northern Territory - annually from within one year of commencing sexual intercourse to age 60
Tasmania - annually
Victoria - 2 yearly from age 18 or commencing sexual intercourse

The above list, although not comprehensive, does illustrate the variety of recommendations which are currently promoted in Australia. Women and medical practitioners are confused by this variety. If the general level of knowledge concerning screening for cervical cancer is to be improved, then it is highly desirable that a uniform message be agreed and intensively promoted by all relevant organisations.

4.3 VARIATION OF THE RECOMMENDED SCREENING INTERVAL BY RISK FACTOR STATUS

While a variation of the recommended screening interval with age can be promoted with some difficulty, a variation by risk factor profile would be exceedingly difficult to promote. Known risk factors for this cancer include increasing age, infection with human papillomavirus ("wart virus" infection), multiple sexual partners (and multiple sexual partners in the male partners of women), early age at first intercourse, and possibly smoking and use of the oral contraceptive. The evidence for an association between cancer of the cervix and the last two factors (smoking, use of the oral contraceptive) is less impressive than the other factors listed.

Selected screening of a "high risk" group rather than population screening can be considered if the following conditions apply:

(1) if members of the "high risk" group can be accurately identified,
(2) if a large proportion of all cancers occur within the "high risk" group,
(3) if the "high risk" group constitutes a sufficiently small proportion of all members of the population.

Conditions (1) and (3) would be difficult to reasonably apply to cervical cancer screening. Whether condition (2) could be satisfied depends on who is defined as "high risk" by condition (1). Thus the value of a "high risk" approach to cervical cancer screening is unproven.

There is a common belief that the "high risk" groups for cervical cancer should be screened more frequently because of a correlation between the risk factor profile and the speed of growth of the cancer. While a high risk category does influence the potential benefit a woman will receive from screening, it does not correlate with the natural history of the cancer.

To date, although a number of cases of rapid onset cancer have been reported, there has been no evidence of a particular group which is preferentially affected. The majority of reports of rapid onset cervical cancer have been in young women (25-31), but this may be because they are a comparatively well screened group where because of the screening, the rapid onset has been apparent. Studies which have taken account of the different screening frequencies between young and older women have found, to date, no evidence to support the idea that rapid onset cancer preferentially affects younger women (32). Most of the data in these studies came from women with invasive cancer which was diagnosed in the 1960s and 1970s.

4.4 CHARACTERISTICS OF AN IDEAL SCREENING INTERVAL

Ideally the screening interval should have the following four characteristics:

(1) a message which is easily understood by women of all ages, of all cultural backgrounds and of all standards of education
(2) be acceptable to the community in terms of the number and proportion of women who will develop invasive cancer between screens
(3) not exceed the available resources both financial and human (particularly cytotechnologists and cytopathologists) to fulfil the recommendations
(4) offer a satisfactory level of benefit in relation to costs incurred. This point is explored in the following cost-effectiveness analysis.

5 THE COST-EFFECTIVENESS APPROACH TO SETTING THE SCREENING INTERVAL -ESTIMATING THE CRITICAL INPUT VARIABLES

A rational setting of the recommended interval between smears requires a consideration of the costs and benefits of different schedules. The key point to emphasise is that it is not so much the total costs of one interval versus another that is important, but rather the additional (ie."incremental" and "marginal") costs and benefits that one screening interval would impose over another. An incremental analysis often points to a different answer to one based solely on consideration of the total costs and benefits of different options.

The following cost-effectiveness analysis will involve:
- estimating the number of cancers which would occur without any screening
- determining the fraction of cancers preventable with different intervals
- estimating the number of life years saved with different intervals
- estimation of the average cost per woman screened

5.1 ESTIMATION OF THE NUMBER OF CANCERS WHICH WOULD BE OCCURRING IF WE HAD NO CERVICAL CANCER SCREENING IN AUSTRALIA

An estimate of the number of cases of cervical cancer Australia could anticipate in the absence of all screening can be made by applying incidence rates for this cancer which have been published by the International Agency for Research on Cancer (IARC) for a Western European type country which has no screening (2) to the estimated number of women in Australia with a cervix. From these calculations it appears that the Australian programme is preventing only about 38% of the cancers which would be occurring if there was no Pap smear screening. See Table 7.

TABLE 7. OBSERVED AND EXPECTED NUMBERS OF CERVICAL CANCER IN AUSTRALIA

Age	No.Australian women with uterus (from ref.5)	No.cancers expected in absence of screening	No.cancers observed in 1982	No.cancers prevented	Proportion prevented
20-24	633,133	32	10	22	69%
25-29	642,190	96	67	29	30%
30-34	587,157	147	103	44	30%
35-69	2,324,269	1046	644	402	38%
Total	4,186,749	1321	824	497	38%

SUMMARY OF THE NUMBER OF CANCERS EXPECTED IF AUSTRALIA HAD NO SCREENING:

"BEST ESTIMATE" = 1321 cancers/year
"HIGH ESTIMATE" = 1585 cancers/year (based on 120% of best estimate)
"LOW ESTIMATE" = 1189 cancers/year (based on 90% of best estimate)

5.2 ESTIMATION OF THE FRACTION OF CANCERS PREVENTABLE WITH DIFFERENT SCREENING INTERVALS

An area of great debate is the proportion of cancers which are preventable with different screening intervals and whether this proportion varies with the age of the women or has altered in very recent times. The paucity of population based data, both local and international, has hindered our ability to evaluate this area fully.

5.2.1 INTERNATIONAL DATA

The effects of screening at different intervals have been modelled in many studies. Their acceptance has been limited, mostly because of the assumptions required to generate the models. In particular three assumptions have been disputed. First, that cervical cancer is always preceded by a period of intraepithelial neoplasia. Second, the proportion of intraepithelial neoplastic lesions which progress to invasive cancer and thirdly, the range of times over which these transitions occur.

More recently the IARC utilised a new approach to determining the fraction of cancers preventable with different screening intervals (32). They determined that 93.5% of cancers could be prevented with annual screening, 92.5% with 2 yearly screening and 90.8% with 3 yearly screening. These estimates were based on the screening histories during the 1960s and 1970s of women aged 35-64 years in 7 Northern Hemisphere centres where centrally organised screening was performed. There is concern that a recent change in the natural history of cervical cancer, particularly in younger women, may have been missed by this study.

5.2.2 LOCAL DATA

The number of women who are diagnosed with invasive cancer within short periods of time from negative cytology are a prime concern in setting the rescreening interval within Australia. While there is no doubt that these women exist, what has been less clear is the proportion of women with cancer they represent and whether Australia has more "rapid onset cancer" than other countries. There are two approaches possible to determining the proportion of women so affected

(1) A retrospective review of the smear histories of women who are diagnosed with invasive cancer. The difficulties with this approach relate to the problems of compiling a comprehensive screening history from many laboratories and the large proportion of women with invasive cancer who have had either no smears or infrequent smears.

(2) A prospective study of the rate of cancer diagnosis in women who were screened negative by one laboratory. Rather than studying the screening history of women with cancer, this type of study commences with the large group of women who are given negative reports and for whom the selection of an appropriate rescreening interval is most critical.

This local analysis will take the latter approach. The 250,000 women who received cytology reports of either no abnormal cells or benign changes from the VCGS during each of the years from 1980 to 1984 were followed forward for up to 3 years to observe their rate of diagnosis of invasive squamous cell carcinoma. These reports will subsequently be referred to as "negative" in that no comment was made of any features of cancer or precancer, including HPV infection. While the same women may have been screened negative more than once during the years 1980 to 1984, account was taken only of one negative smear report in any calendar year.

Monitoring of subsequent diagnoses of cancer in these screened women was made through notifications to the Victorian Cancer Registry and through the follow-up system operating within the VCGS. The time between the last negative cytology report and the date of diagnosis of cancer was calculated. These women will be referred to as "observed interval cases". The number of "expected interval cases" was determined by applying the rates of cancer which were expected in a Western country in the absence of a screening programme to the number of women who were screened negative (32).

In this analysis age refers to age at the time of negative cytology. Women with preceding cytological or histological evidence of CIN or HPV infection were not excluded from the analysis, provided they were eligible by having a negative cytology report between the earlier abnormality and the later diagnosis of cancer.

Over the 3 year time period after a negative report was issued, a total of 98 cancer episodes were observed among the negatively screened women, compared to an expected number of 817. The distribution of the observed cancer episodes by time is shown in Table 8.

TABLE 8: DISTRIBUTION OF OBSERVED INTERVAL CANCER EPISODES BY TIME SINCE NEGATIVE CYTOLOGY, VCGS 1980-1984

	YEAR OF SCREENING					
	1980	1981	1982	1983	1984	TOTAL
INTERVAL AFTER SCREENING						
Year 1	5	4	6	6	9	30
Year 2	17	7	8	5		37
Year 3	8	11	12			31
						98

The proportion of observed to expected interval cancer episodes was 8.8% (30/340) during year 1, 13.6% (37/273) during year 2, and 15.2% (31/204) during year 3.

A different pattern was evident between younger and older women in the ratio of observed to expected interval cancer episodes for each year of observation after negative cytology. Women in the younger age range (15-34 yrs) had a sharp increase in the ratio between years one and two, but a lesser rise between years two and three. Older women (35-69 yrs) had a relatively constant ratio over the 3 years of observation. See Table 9.

TABLE 9: RATIO OF OBSERVED TO EXPECTED NUMBER OF CANCER EPISODES IN YEARS 1-3 FOR WOMEN AGED 15-34 YEARS AND 35-69 YEARS

	AGE 15-34 YEARS			AGE 35-69 YEARS		
	Observed	Expected	Ratio	Observed	Expected	Ratio
YEAR 1	4	90.8	4.4%	26	249.2	10.4%
YEAR 2	21	70.6	29.7%	16	202.1	7.9%
YEAR 3	17	50.7	33.5%	14	153.5	9.1%
	42	212.1		56	604.8	

Taken over the 3 years, the cumulative rate of cancer diagnosis was 20% (42/212) in the younger women and 9% (56/605) in the older women.

If both observed and expected cancer episodes are converted to women, (ie. adjustment is made in both the numerator and the denominator for women who were rescreened in later calendar years) the younger age group experienced 20% (38/193) of the expected number of cancers in the 36 months after negative cytology and older women 10% (54/536).

The screened women were initially followed forward for three years, this being the longest interval currently recommended in Australia between Pap smears. Because of the constancy of the ratio among women aged 35-69 years, the analysis was subsequently extended to cover a period of 5 years. During the fourth year, the ratio of observed to expected cancer episodes was 41% among the younger women and 12% among the older women. During the fifth year, the ratio was 46% among the younger women and 14% among the older women.

The proportion of cancers which are potentially preventable with different screening intervals was calculated by summating the observed number of cancer episodes for individual years, dividing by the number of expected cancer episodes, and subtracting the result from unity. See Table 10.

TABLE 10: PROPORTION OF CANCERS PREVENTABLE WITH DIFFERENT SCREENING INTERVALS (Based on cumulative counts of observed and expected interval cancer episodes)

SCREENING INTERVAL	AGE 15-34 YEARS	AGE 35-69 YEARS
One year	95%	90%
Two years	84%	90%
Three years	80%	90%

These preventable proportions for women aged 35-69 years are consistent with the IARC collaborative study (32); the results for women aged 15-34 years cannot reasonably be compared with the IARC study which did not explore the preventability of cancer in the 1980s for women aged less than 30 years.

SUMMARY OF PREVENTABLE FRACTIONS:

* WOMEN AGED 15-34 YEARS

"BEST ESTIMATES"	1 year screening interval	95%
	2 year screening interval	84%
	3 year screening interval	80%
"HIGH ESTIMATES"	1 year screening interval	97%
	2 year screening interval	89%
	3 year screening interval	87%

(Based on a 33% improvement in the best estimates)

"LOW ESTIMATES"	1 year screening interval	93%
	2 year screening interval	79%
	3 year screening interval	73%

(Based on a 33% deterioration in the best estimates)

* WOMEN AGED 35-69 YEARS

"BEST ESTIMATES" Screening interval of 1, 2 or 3 years 90%

"HIGH ESTIMATES" Screening interval of 1, 2 or 3 years 93%
(Based on a 33% improvement in the best estimates)

"LOW ESTIMATES" Screening interval of 1, 2 or 3 years 87%
(Based on a 33% deterioration in the best estimates)

5.3 ESTIMATION OF THE NUMBER OF LIFE YEARS SAVED PER CANCER PREVENTED

A cancer prevented via screening does not automatically equate with a prevented death. In the absence of screening some cancers would still be detected at a stage when cure was possible.

This section has assumed

(a) that a cancer not detected by screening would be diagnosed at Stage 2 by the FIGO classification and have 40% mortality at 5 years for women of all age groups.

(b) that 15 years after diagnosis a further 6% of the women aged 20-54 years will have died from the cancer of the cervix, and 16% in women aged 55-69 years at diagnosis.
These mortality rates are taken from Norwegian figures (12).

(c) that none of the women whose deaths from cancer of the cervix are prevented die from other causes of death before age 75 years.

Using these assumptions, it can be determined that the average number of life years contributed by a woman aged 20-34 years at diagnosis is 20.1 life years per prevented cancer; for women aged 35-69 years at diagnosis an average of 8.7 life years per prevented cancer are saved.

The following example demonstrates the method used to derive these estimates:

EXAMPLE: CALCULATION OF THE NUMBER OF LIFE YEARS WHICH COULD BE SAVED PER PREVENTED CANCER IN WOMEN AGED 20-24 YEARS AT DIAGNOSIS

Number of cancers expected if no screening = 32
With 40% mortality at 5 years, 12.8 deaths could be expected.
These deaths could be prevented by screening.
Each prevented death potentially contributes 50 life years to age 75.
Therefore screening of women aged 20-24 potentially saves 640 life years.
With a further 6% mortality at 15 years, 1.92 further deaths would occur increasing the 640 potential life years by 76.8 to 716.8 life yrs.
Therefore 716.8 life years would be saved for 32 cancers prevented, giving an average of 22.4 life years saved/prevented cancer.

The following table shows the estimates for women of each age range.

TABLE 11: AVERAGE NO.OF LIFE YEARS SAVED/PREVENTED CANCER BY AGE AT DIAGNOSIS

AGE GROUP	AVERAGE NO. LIFE YEARS SAVED PER PREVENTED CANCER
20-24	22.4
25-29	20.1
30-34	17.8
35-39	15.5
40-44	13.2
45-49	10.9
50-54	8.6
55-59	6.8
60-64	4.0
65-69	2.0

SUMMARY OF NUMBER OF LIFE YEARS SAVED PER CANCER PREVENTED:

"BEST ESTIMATE"
20.1 life years saved/prevented cancer for women aged 20-34 years
8.7 life years saved/prevented cancer for women aged 35-69 years

"LOW ESTIMATE OF NUMBER OF LIFE YEARS SAVED" (using 70% relative survival)
15.6 life years saved/prevented cancer for women aged 20-34 years
6.7 life years saved/prevented cancer for women aged 35-69 years

"HIGH ESTIMATE OF NUMBER OF LIFE YEARS SAVED" (using 50% relative survival)
24.6 life years saved/prevented cancer for women aged 20-34 years
10.7 life years saved/prevented cancer for women aged 35-69 years

5.4 ESTIMATION OF THE AVERAGE COST PER WOMAN SCREENED

The following components have been included:

- cost of taking the smear and receiving the results
- laboratory cost for reporting on the smear
- management costs for non-progressive lesions which are detected as a result of screening

The following are not included in the costing:

- recruitment and health promotion costs
- cost of administering a call and recall system
- savings from reduction in management costs for the women with invasive cancer. While it is reasonably straightforward to cost the management of a woman with Stage 1 or 2 cancer, this becomes very much more difficult for women with the advanced stages of cancer.
- indirect costs such as lost wages due to attendance at a medical practitioner or due to premature mortality
- costs of treating other diseases at a later time in the women whose lives have been saved

Economists place emphasis on the concept of "opportunity cost" in costing health programmes; that is, the value of other opportunities which are forgone when resources are used in one particular way. There are various ways in which opportunity cost can be assessed, and in the time available this analysis has relied on the Medicare schedule fee. Thus the majority of the costs considered are those incurred by the Health Insurance Commission (and ultimately the taxpayer), with a smaller proportion being the responsibility of the consumer or health insurance company.

While it is accepted that some fees charged for medical services are in excess of the scheduled fee, others are less (eg. women managed in public hospitals or community health centres). This is not of great concern to this analysis as the same items appear in each of the screening intervals and each analysis is costed in the same way - the only variation being in the number of services performed with each screening interval. If it is believed that the costs have been either under-represented or over-represented, then the impact of different figures can be assessed via the sensitivity analysis in Appendix 1.

The expenditure associated with different screening intervals was calculated using $20 as the average cost of taking a smear and receiving the results, and $18.40 for the laboratory costs of reporting a smear. Applying the figure of $38.40 per woman screened to the 4,186,749 women in Australia aged 20-69 years who have not had a hysterectomy gives a cost of $160,771,162 for the taking and reporting the Pap smears per screening round. To this figure must be added the cost of managing women with abnormalities detected as a result of the screening programme, but which in the absence of treatment would have spontaneously regressed.

It has been assumed

(a) that lesions of the severity of CIN 1 and 2 are together diagnosed at 118% the age-specific rates of CIN 3 and that benign abnormalities (which are investigated to biopsy) at 6% the rate of CIN 3. These estimates are based on the ratio of histological diagnoses of CIN 1 and 2 to CIN 3 reported to the VCGS during 1984 (33).

(b) that the rate of detection of non-progressive lesions per screening

round would not vary with screening frequency. This may not be strictly correct, but there is no published information to provide guidance on this point. Any variation from this assumption would not dramatically affect the cost estimates in the body of the paper.

(c) that 70% of CIN 3 lesions and 80% of CIN 1 and 2 lesions would be non-progressive in the absence of therapy.

Applying these rates to the "at risk" female population of Australia gives a total of 19,375 women investigated per screening round for non-progressive disease if all eligible women were screened. The management costs per investigated woman have been costed at an average of $685 per woman according to the treatment profile in Table 12. (Recent figures as shown in Section 7 would indicate that the estimates used here are very conservative).

TABLE 12: MANAGEMENT COSTS FOR WOMEN WITH ABNORMAL PAP SMEAR WHICH IN THE ABSENCE OF TREATMENT WOULD NOT PROGRESS TO INVASIVE CANCER

	$
GP visit	17.60
Specialist visit	50.00
Colposcopy & punch biopsy	37.00
Histopathology report	80.00
Day case hospitalisation	110.00
Colposcopy/biopsy/diathermy	118.00
Theatre fees	80.00
Anaethetist's fees	76.00
Specialist review at 3 months	25.00
Colposcopy	37.00
Pap smear	18.40
GP review at 12 months	17.60
Pap smear	18.40

The total of these management costs per screening round is $13,271,875, or 8.3% of the screening costs. Adding the management costs of non-progressive lesions to the screening costs gives the total cost of the screening programme as $174,043,037 or an average cost per woman screened of $41.57.

Thus the costs associated with having the Pap smear taken and receiving the results represent 48% of the average cost per woman screened. This is broadly consistent with a recent estimate that the collection costs accounted for up to 40% of the cost of running the cervical cytology screening programme in the UK (34). While lower estimates of the cost can be derived if it is assumed that the women is already in the practitioner's office for other reasons, this underestimates the true cost of a screening programme.

SUMMARY OF THE AVERAGE COST PER WOMAN SCREENED:

"BEST ESTIMATE"	$41.57 per woman screened
"LOW ESTIMATE"	$37.41 per woman screened (based on 90% of best estimate)
"HIGH ESTIMATE"	$45.73 per woman screened (based on 110% of best estimate)

6 RESULTS OF THE COST EFFECTIVENESS ANALYSIS

In the following sections data will be presented individually for two age ranges (20-34 years and 35-69 years) because of the lower incidence rates of cervical cancer in the younger age group and the apparent difference in preventable fractions between younger and older women from VCGS analyses.

Financial costs after year 1 have been discounted at a rate of 10% to reflect the fact that dollars spent in the future should not weigh as heavily in programme decisions as dollars spent today. It has been assumed that all costs are incurred at the beginning of each year. Discounting of health benefits to their present value has not been undertaken as the benefit to the majority of the women who are screened is immediate being the reassurance that they do not have cancer. (Appendix 2 shows a cost effectiveness analysis with discounted benefits). All cost estimates have been calculated using number of cancers prevented and number of lives saved to 2 decimal places. For ease of comprehension, only whole numbers of women have been referred to in tables.

None of the analyses include an allowance for the costs of managing women with cancer. As a greater number of women will develop and die from cancer with lengthening the interval between screens, theoretically the additional costs of managing these women should be added. A decision was made not to cost the management of women with curable cancer and incurable cancer. While the former is relatively straightforward, the latter is extremely difficult to do well and would require a major study which was not feasible in the time available before the consensus conference. It would appear that the financial costs of caring for women dying of cancer are small in relation to the screening costs - possibly less than $10,000 per case (35), and would, with a 100% community acceptance of regular Pap smear screening, apply to between 48 and 64 women each year, depending on the screening interval selected.

Similarly we have not attempted to cost the additional use of health services made by the women whose deaths from cervical cancer are prevented but who later develop other diseases requiring medical attention.

6.1 TOTAL COST OF THE SCREENING PROGRAMME

If all Australian women who are "at risk" of cervical cancer were screened, the following annual costs would be incurred:

SCREENING INTERVAL	PRESENT VALUE OF ANNUAL TOTAL COST		
	Women 20-34 years (n=1,862,480)	Women 35-69 years (n=2,324,269)	Total
1 year	$77.4 million	$96.6 million	$174 million
2 years	$36.9 million	$46.1 million	$83 million
3 years	$23.5 million	$29.4 million	$53 million
5 years	$12.9 million	$16.1 million	$29 million

A programme of 3 yearly screening rather than annual screening would therefore free up $121 million per year.

6.2 AVERAGE COSTS PER PREVENTED CANCER, PER LIFE SAVED, AND PER YEAR OF LIFE SAVED WITH DIFFERENT SCREENING INTERVALS

6.2.1 WOMEN AGED 20-34 YEARS

	SCREENING INTERVAL		
	3 yrs	2 yrs	1 yr
No.cancers prevented/yr	221	232	262
No.cancers missed/yr	55	44	14
No.lives saved/yr	88	92	104
No.deaths/yr (after 5 yrs)	22	18	6
Present value of the average cost			
- per prevented cancer	$106,577	$159,386	$295,283
- per life saved	$266,444	$398,466	$738,208
- per year of life saved	$5,302	$7,929	$14,690

6.2.2 WOMEN AGED 35-69 YEARS

	SCREENING INTERVAL		
	3 yrs	2 yrs	1 yr
No.cancers prevented/yr	941	941	941
No.cancers missed/yr	105	105	105
No.lives saved/yr	376	376	376
No.deaths/yr (after 5 yrs)	42	42	42
Present value of average cost			
- per prevented cancer	$31,195	$48,984	$102,634
- per life saved	$77,987	$122,461	$256,585
- per year of life saved	$3,585	$5,630	$11,797

Reworking the analysis of 6.2.2 using the preventable fractions of the IARC study (32) gives the following very similar cost results:

	SCREENING INTERVAL		
	3 yrs	2 yrs	1 yr
Present value of average cost			
- per prevented cancer	$30,920	$47,660	$98,792
- per life saved	$77,300	$119,152	$246,980
- per year of life saved	$3,554	$5,478	$11,355

While the average cost per cancer prevented and per life saved in women aged 20-34 years is three times that of women aged 35-69 years, when account is taken of the greater number of life years saved for younger women, the cost per life year saved for younger women is only 20%-45% greater than for older women for the same screening interval. However in comparison with the average cost for 3 yearly screening of older women, annual screening of younger women would cost four times as much per year of life saved.

6.3 INCREMENTAL COSTS AND BENEFITS

Incremental costs are the additonal costs that one screening interval would impose over another, and incremental benefits the additional benefits delivered by one screening interval compared with another. For cervical cancer screening, the incremental costs incurred annually with a progressive shortening of the screening interval can be estimated as follows:

REDUCTION OF SCREENING INTERVAL	PRESENT VALUE OF ANNUAL INCREMENTAL COSTS	
	Women aged 20-34 years (n=1,862,480)	Women aged 35-69 years (n=2,324,269)
from 5 yrs to 3 yrs	$10.6 million	$13.3 million
from 3 yrs to 2 yrs	$13.4 million	$16.8 million
from 2 yrs to 1 yr	$40.5 million	$50.5 million
from 3 yrs to 1 yr	$53.9 million	$67.3 million

The average costs of Section 6.2 conceal the fact that for women aged 20-34 years only a small additional number of deaths are prevented when the interval between screens is reduced although the costs increase dramatically. These average costs comprise a large number of women whose lives would be saved with less frequent screening (and who therefore cost rather less), and a very much smaller number of additional women whose lives are saved as a result of the frequent screening but at very much greater cost. These ideas are explored further in this section on marginal costs.

The term "marginal cost" refers to the extra costs incurred in producing one further unit of output. The following section shows the marginal cost per additional life saved and per additional year of life saved with reduction in the screening interval.

6.3.1 MARGINAL COST FOR WOMEN AGED 20-34 YEARS
(using estimates of the preventable fractions from VCGS data)

	REDUCTION OF THE SCREENING INTERVAL	
	3 yrs -> 2 yrs	2 yrs -> 1 yr
No. additional lives saved/yr	4	12
Marginal cost		
- per additional life saved	$3,038,909	$3,332,599
- per additional life year saved	$60,475	$66,320

6.3.2 MARGINAL COST FOR WOMEN AGED 35-69 YEARS
(using estimates of the preventable fractions from IARC study (32))

	REDUCTION OF THE SCREENING INTERVAL		
	5 yrs->3 yrs	3 yrs->2 yrs	2 yrs->1 yr
No. additional lives saved/yr	30	8	4
Marginal cost			
- per additional life saved	$439,891	$2,354,512	$12,071,132
- per additional life year saved	$20,224	$108,253	$554,994

7 INTERVENTION RATES ASSOCIATED WITH PAP SMEAR SCREENING

After an abnormal Pap smear report is issued, the recommendation to the woman is usually for either a repeat Pap smear after a short time period has elapsed or for further investigation and treatment (colposcopy, biopsy, cautery, hysterectomy etc).

Claims to the Health Insurance Commission from patients having these procedures as private patients show a wide age variation in intervention rates. Younger women receive almost 60% more interventions per 1000 screenings than do older women. See Table 13.

TABLE 13: INTERVENTION RATES BY AGE PER 1000 PAP SMEAR TESTS

Age Group	Intervention Rate*/1000 smears
15-19	108
20-24	134
25-29	119
30-34	105
35-39	93
40-44	79
45-49	69
50-54	62
55-59	47
60-64	47
65-69	46

* Includes colposcopy (Item 6415)
cautery (Item 6411)
cone biopsy (Items 6430 & 6431)
colposcopy biopsy and diathermy (Item 6483)

These intervention rates will be underestimates as they do not include women having these procedures as public patients.

Despite being underestimates, these rates are cause for some concern. Published incidence rates in 1982 showed that only 1.5 cases of invasive cervical cancer were diagnosed per 100,000 women aged 20-24 years (1). In the absence of all screening, the IARC has estimated the rate would be 5 cancers per 100,000 women per year for women of this age group (2). The South Australian rates for carcinoma in situ for women aged 20-24 years suggest that 77 women per 100,000 may develop carcinoma in situ each year (3). Against these rates, the figures in Table 13 suggest that the minimum number of investigations per 100,000 Pap smear tests in the age group 20-24 years is 13,400.

The benefits of screening women of young age are less clearcut than may at first be apparent. Considerable overinvestigation of many would appear to be the price of preventing a small number of cancers.

8 THE REALITY IN AUSTRALIA FOR THE NEXT 5 YEARS

Section 6 has outlined potential cost benefit scenarios with different screening intervals assuming a 100% acceptance of screening by women. The reality is that less than 100% acceptance will be achieved in Australia in the next 5 years.

A 20% non-acceptance of screening among women aged 20-34 years would see 55 cancers and 22 deaths occurring annually among the unscreened group. A 30% non-acceptance of screening among women aged 35-69 years would see 314 cancers and 126 deaths per years among the unscreened women. These calculations have assumed that the unscreened women would be at average risk of cervical cancer; some believe that unscreened women have an high risk profile for cervical cancer, quite apart from any additional risk incurred because of a lack of screening.

Finally two relevant points to Pap smear screening in Australia were made recently in an article which explored the efficiency of a range of cervical cancer screening options in the United Kingdom (36). First, the use of incidental health contacts as an opportunity to take a Pap smear (eg. during pregnancy and family planning consultations) was considered to produce few advantages and to considerably complicate establishing regular screening patterns for individual women. Second, achieving high attendance rates was considered as important in producing good outcomes of the screening programme as focussing on complex policies.

9 COMPARISON EXAMPLE: COSTS OF MAMMOGRAPHIC SCREENING FOR BREAST CANCER

For comparison, the costs of mammographic screening for breast cancer were estimated assuming biennial single view mammography costing $35 for the 1,368,092 women aged 50-69 years. This would reduce mortality by 40% after 5 years (37). Annual 2 view mammography costing $40 for the 881,697 women aged 40-49 years would achieve either a 20% or 25% reduction in mortality. (Two estimates of the mortality reduction for younger women were used; currently there is no evidence as to the efficacy of annual single view mammography for women aged 40-49 years).

These percentage reductions were applied to the 1982 Australian statistics where 336 deaths occurred from breast cancer in women aged 45-54 years, and 949 deaths in women aged 55-74 years (1). Preventing a death from breast cancer in women aged 50-69 years at diagnosis was estimated to contribute an average 15 years of life to age 75 and in women aged 40-49 years at diagnosis an average of 30 years of life. Investigating false positive mammography results was costed at 10.9% of the basic screening costs (38).

Biennial mammographic screening in women aged 50-69 years would prevent 379 deaths annually after 5 years at an average cost of $69,945 per life saved and $4,663 per year of life saved. Annual mammographic screening of women aged 40-49 years would prevent 67 deaths annually after 5 years at an average cost of $582,024 per life saved and $19,401 per year of life saved if the reduction in mortality was 20%, and 84 lives annually after 5 years at a average cost of $465,619 per life saved and $15,521 per year of life saved if the reduction in mortality was 25%.

10 SUMMARY

	SCREENING INTERVAL		
	1 year	2 years	3 years
No.women screened/yr			
- women age 20-34 yrs	1,862,480	931,240	620,826
- women age 35-69 yrs	2,324,269	1,162,134	774,756
No.cancers prevented/yr			
- women age 20-34 yrs	262	232	221
- women age 35-69 yrs	941	941	941
No.cancers missed/year			
- women age 20-34 yrs	14	44	55
- women age 35-69 yrs	105	105	105
No.deaths/year			
- women age 20-34 yrs	6	18	22
- women age 35-69 yrs	42	42	42
Annual screening cost			
- women age 20-34 yrs	$77,423,293	$36,952,202	$23,532,379
- women age 35-69 yrs	$96,619,862	$46,114,244	$29,367,070
Average screening cost per prevented cancer			
- women age 20-34 yrs	$295,283	$159,386	$106,577
- women age 35-69 yrs	$102,634	$48,984	$31,195
Average screening costs/year of life saved			
- women age 20-34 yrs	$14,690	$7,929	$5,302
- women age 35-69 yrs	$11,797	$5,630	$3,585

Marginal cost/additional life saved if screening interval reduced		
in women aged 20-34 yrs	3 yrs -> 2 yrs	$3,038,909
	2 yrs -> 1 yr	$3,332,599
in women aged 35-69 yrs*	5 yrs -> 3 yrs	$439,891
	3 yrs -> 2 yrs	$2,354,512
	2 yrs -> 1 yr	$12,071,132

Marginal cost/additional year of life saved if screening interval reduced		
in women aged 20-34 yrs	3 yrs -> 2 yrs	$60,475
	2 yrs -> 1 yr	$66,320
in women aged 35-69 yrs*	5 yrs -> 3 yrs	$20,224
	3 yrs -> 2 yrs	$108,253
	2 yrs -> 1 yr	$554,994

* using estimates of preventable fraction from IARC study (32)

11 GLOSSARY

Average cost - the average cost per unit of output

Benign - an abnormality which is not malignant

Biopsy - the removal of a small piece of tissue for laboratory examination by a pathologist to determine whether it is malignant

Carcinoma - a cancer that originates in the tissue that make up the lining of the internal and external surfaces of the body (eg. skin, the linings of the mouth, lungs, vagina etc)

Carcinoma in situ (CIN 3) - a stage in the development of a carcinoma when it is still confined to the layer of tissue in which it started. It is a precursor stage to cancer; treatment at the stage of carcinoma in situ will prevent the development of cancer.

Cervical intraepithelial neoplasia (CIN) - a pathology term indicating that abnormal cells are present in the cervix. A small proportion of these lesions will progress to cancer if left untreated. CIN is progressively graded as 1, 2 or 3 with increasing severity of the lesion.

Cervix - the neck of the womb

Colposcopy - the procedure of examination of the vagina and cervix with a magnifying instrument called a colposcope to assist in diagnosing abnormalities

Cost effectiveness analysis - an analysis of the costs of achieving a given end. The most cost effective method is the one that produces the required outcome at least cost.

Cytology - microscopic examination of individual or groups of cells

Diathermy - the use of electrical current to destroy abnormal tissue

Discounting - a method of reducing future expenditures to reflect the fact that money spent in the future should not weigh as heavily in programme decisions as dollars spent today. (Discounting of future benefits to their present value has not been undertaken in the analysis).

False negative - a report which (falsely) indicates that no abnormality was present, when in truth an abnormality was present but has been missed

High risk - an above-average possibilitiy that a disease might occur in a given individual or population. It is stressed that not all individuals at high risk will develop the disease.

Histology - examination under a microscope of tissue taken from the body

Hysterectomy - an operation to remove the uterus; usually, but not always, the cervix is removed

IARC - International Agency for Research on Cancer

Incidence - the number of newly diagnosed cases of disease in a defined population within a defined period of time

Interval cancers - cancers which are diagnosed because of symptoms within a stated interval after a negative screening test result

Incremental cost - the additional costs that one service/programme imposes over another

Lesion - an abnormality in a tissue of the body

Malignant - having a tendency to invade and destroy body tissue and to spread

Mammography - x-ray examination of the breast

Marginal cost - the additional cost of producing one extra unit of output

Mortality - the number of people in a defined population who die within a defined time period

Neoplasia - the growth of a tumour or new tissue

Pap smear - a test to detect precursor lesions to cancer of the cervix. Cells from the cervix are collected and smeared on a glass slide, then examined under a microscope for any abnormality.
Also called Pap test, smear test, cervical smear.

Precursor lesion - a change in the cells which may precede the eventual development of cancer. Only a minority of precursor lesions of the cervix would develop into cancer in the absence of treatment.

Present value - the current cost of a future expenditure which has been discounted at a stated rate

Prevalence - the number of cases of disease that exist in a defined population at some point in time

Preventable fraction - the proportion of cancer which could be prevented by use of screening

Regression - the spontaneous disappearance of an abnormality

Risk - a measure of the likelihood of developing a disease

Screening - the examining and/or testing of a large number of "well" people to identify those at risk of a particular disease

Sensitivity - the ability of a test to detect a disease

Sensitivity analysis - the provision of a range of estimates of output costs based on differing assumptions about the values that the input variables are likely to take

Survival rate - the proportion of patients with a disease who are alive at a given time after diagnosis

12 REFERENCES

1 Giles GG, Armstrong BK, Smith LR
Cancer in Australia 1982
National Cancer Statistics Clearing House,
Scientific Publication No.1,1987

2 Hakama M, Miller AB, Day NE eds
Screening for cancer of the uterine cervix
Lyon, IARC Scientific Publication No.76; 208

3 Bonett A, Roder D
Epidemiology of Cancer in South Australia
Adelaide, Lutheran Publishing House, 1986

4 Armstrong BK, Holman D
Increasing mortality from cancer of the cervix in young Australian women
Med J Aust 1981; 1:460-462

5 Holman CDJ, Armstrong BK
Cervical cancer mortality trends in Australia - an update
Med J Aust 1987; 146:410-412

6 Armstrong BK, Allen OV, Brennan BA et al
Time trends in prevalence of cervical cytological abnormality in women attending a STD clinic and their relationship to trends in sexual activity and specific infections
Br J Cancer 1986; 54:669-675

7 Mitchell H, Medley G
Pap smear results of Victorian teenagers, 1980-1987
Aust NZ J Obstet Gynaecol 1988 (in press)

8 Hakama M
Trends in the incidence of cervical cancer in the Nordic countries
In Magnus K (ed.), Trends in cancer incidence - causes and practical implications
Washington, Hemisphere Publishing Corp., 1982; 279-292

9 Bonett A, Roder D, Esterman A
Determinants of case survival for cancers of the lung, colon, breast and cervix in South Australia
Med J Aust 1984; 141:705-709

10 Russell JM, Blair V, Hunter RD
Cervical carcinoma: prognosis in younger patients
Br Med J 1987;295: 300-303

11 Smales E, Perry CM, Ashby MA, Baker JW
The influence of age on prognosis in carcinoma of the cervix
Br J Obstet Gynaecol 1987; 94:784-787

12 Survival of Cancer Patients
The Norwegian Cancer Society, Oslo 1975, 93-96

13 Meanwell CA, Kelly KA, Wilson S et al
Young age as a prognostic factor in cervical cancer: analysis of population based data from 10,022 cases
Br Med J 1988; 296:386-391

14 Mitchell H, Medley G
Age trends in Pap smear usage, 1971-1986
Comm Health Studies 1987; 11:183-185

15 Dickinson JA, Leeder SL, Sanson-Fisher RW
Frequency of cervical smear-tests among patients of general practitioners
Med J Aust 1988; 148:128-131

16 Armstrong BK, Rouse IL, Butler TL
Cervical cytology in Western Australia
Med J Aust 1986; 144:239-248

17 Skegg DGG, Paul C, Seddon RJ et al
Recommendations for routine cervical screening
NZ Med J 1985; 98:636-639

18 Fink DJ
Change in American Cancer Society checkup guidelines for detection of cervical cancer
CA 1988; 38:127-128

19 Cervical cancer screening programs: summary of the 1982 Canadian task force report
Can Med Assoc J 1982; 127:581-589

20 Draper GJ
Health Trends 1982; 14:37

21 Working Party Report
Lancet 1987; 2:1412

22 Geirsson G, Kristiansdottir R, Sigurdsson K, Moss S, Tulinis H
Cervical cancer screening in Iceland: a case-control study
In Hakama M, Miller AB, Day N
Screening for cancer of the uterine cervix
Lyon: IARC Scientific Publication No.76:37-41

23 Petersson F, Bjorkholm E, Naslund I
Evaluation of screening for cervical cancer in Sweden: trends in incidence and mortality 1958-1980
Int J Epidem 1985; 14:521-527

24 Fleming WB
The cancer-related health check-up
Med J Aust Suppl 1985; 143:537

25 LiVolsi VA
Cytologic screening intervals
Am J Obstet Gynecol 1984; 148:833

26 Syrjanen K, Michelle de Villiers E, Saarikoski S et al
Cervical papillomavirus infection progressing to invasive cancer in less than 3 years
Lancet 1985; 1:510-511

27 Berkeley AS, LiVolsi VA, Schwartz PE
Advanced squamous cell carcinoma of the cervix with recent normal Papanicoloau tests
Lancet 1980; 2:375-376

28 Bain RW, Crocker DW
Rapid onset of cervical cancer in an upper socioeconomic group
Am J Obstet Gynaecol 1983; 146:366-371

29 MacGregor JE
Rapid onset cancer of the cervix
Br Med J 1982; 284:441

30 Benoit AG, Krepart GV, Lotocki RJ
Results of prior cytologic screening in patients with a diagnosis of Stage 1 carcinoma of the cervix
Am J Obstet Gynaecol 1984; 148:690-694

31 Paterson MEL, Peel KR, Joslin CAF
Cervical smear histories of 500 women with invasive cervical cancer in Yorkshire
Br Med J 1984; 289:896-898

32 IARC Working Group on evaluation of cervical cancer screening programmes
Screening for squamous cell cancer: duration of low risk after negative results of cervical cytology and its implication for screening policies
Br Med J 1986; 293:659-664

33 Mitchell H, Drake M, Medley G
Papanicolaou smears in Victoria: are the wrong women being screened?
Med J Aust 1987; 147:559-560

34 Charny MC, Farrow SC, Roberts CJ
The cost of saving a life through cervical cytology screening: implications for health policy
Health Policy 1987; 7:345-359

35 Gray D, MacAdam D, Boldy D
A comparative cost analysis of terminal cancer care in home hospice patients and controls
J Chron Dis 1987; 40:801-810

36 Parkin DM, Moss SM
An evaluation of screening policies for cervical cancer in England and Wales using a computer simulation model
J Epid Comm Health 1986; 40:143-153

37 Tabar L, Fagerberg CJG, Gad A et al
Reduction in mortality from breast cancer after mass screening with mammography
Lancet 1985;1: 829-832

38 Breast Cancer Screening
Report to the Health Ministers of England, Wales, Scotland and Northern Ireland
Department of Health and Social Security, London, 1986; 93

13 ACKNOWLEDGEMENTS

The analysis of VCGS data was only possible because of the work undertaken by the staff of the VCGS over the last 23 years. The current director is Dr Gabriele Medley; the previous director was Dr Michael Drake. The work of all VCGS staff is gratefully acknowledged.

The VCGS is funded by the Health Department Victoria. Epidemiological research within the VCGS is supported in part by grants from the NH&MRC Public Health Research and Development Committee and the Anti-Cancer Council of Victoria.

Valuable assistance has been provided by the Victorian Cancer Registry and special thanks go to its director (Dr Graham Giles) and registrar (Mrs Vicki Higgins).

Thanks also goes to the many colleagues who have provided assistance in the preparation of this document.

APPENDIX 1
SENSITIVITY ANALYSES

These sensitivity analyses show the effect on the following costs
- average screening costs/year of life saved
- marginal cost/life saved
- marginal cost/year of life saved

with variation in the four most important input variables as determined in Section 5.

WOMEN AGED 20-34 YEARS

SENSITIVITY ANALYSIS FOR AVERAGE SCREENING COSTS/YEAR OF LIFE SAVED WITH DIFFERENT SCREENING INTERVALS

No. of cancers expected	Prevent-able Fraction	Yrs saved per prev. cancer	Cost	Screening interval 1 yr	2 yrs	3 yrs
Best	Best	Best	Best	$14,690	$7,929	$5,302
High	Best	Best	Best	$12,242	$6,608	$4,418
Low	Best	Best	Best	$16,323	$8,810	$5,891
Best	High	Best	Best	$14,387	$7,484	$4,875
Best	Low	Best	Best	$15,006	$8,431	$5,810
Best	Best	High	Best	$12,003	$6,479	$4,332
Best	Best	Low	Best	$18,928	$10,217	$6,831
Best	Best	Best	High	$16,160	$8,723	$5,832
Best	Best	Best	Low	$13,220	$7,136	$4,771

SENSITIVITY ANALYSIS FOR MARGINAL COSTS PER LIFE SAVED WITH DIFFERENT SCREENING INTERVALS

No. of cancers expected	Prevent-able Fraction	Yrs saved per prev. cancer	Cost	2 yrs ->1 yr	3 yrs ->2 yrs
Best	Best	Best	Best	$3,332,599	$3,038,909
High	Best	Best	Best	$2,777,166	$2,532,424
Low	Best	Best	Best	$3,702,888	$3,376,565
Best	High	Best	Best	$4,582,324	$6,077,818
Best	Low	Best	Best	$2,618,471	$2,025,939
Best	Best	High	Best	$3,332,599	$3,038,909
Best	Best	Low	Best	$3,332,599	$3,038,909
Best	Best	Best	High	$3,666,100	$3,343,019
Best	Best	Best	Low	$2,999,099	$2,734,798

SENSITIVITY ANALYSIS FOR MARGINAL COSTS PER YEAR OF LIFE SAVED WITH DIFFERENT SCREENING INTERVALS

No. of cancers expected	Preventable Fraction	Yrs saved per prev. cancer	Cost	2 yrs ->1 yr	3 yrs ->2 yrs
Best	Best	Best	Best	$66,320	$60,475
High	Best	Best	Best	$55,266	$50,396
Low	Best	Best	Best	$73,689	$67,195
Best	High	Best	Best	$91,190	$120,951
Best	Low	Best	Best	$52,108	$40,317
Best	Best	High	Best	$54,188	$49,413
Best	Best	Low	Best	$85,451	$77,920
Best	Best	Best	High	$72,957	$66,527
Best	Best	Best	Low	$59,683	$54,423

WOMEN AGED 35-69 YEARS

SENSITIVITY ANALYSIS FOR AVERAGE SCREENING COSTS/YEAR OF LIFE SAVED WITH DIFFERENT SCREENING INTERVALS

No. of cancers expected	Preventable Fraction	Yrs saved per prev. cancer	Cost	Screening interval 1 yr	2 yrs	3 yrs
Best	Best	Best	Best	$11,797	$5,630	$3,585
High	Best	Best	Best	$9,830	$4,692	$2,988
Low	Best	Best	Best	$13,107	$6,256	$3,984
Best	High	Best	Best	$11,416	$5,448	$3,469
Best	Low	Best	Best	$12,203	$5,824	$3,709
Best	Best	High	Best	$9,591	$4,578	$2,915
Best	Best	Low	Best	$15,318	$7,311	$4,655
Best	Best	Best	High	$12,977	$6,193	$3,944
Best	Best	Best	Low	$10,616	$5,066	$3,226

APPENDIX 2
AVERAGE AND MARGINAL COSTS WITH DISCOUNTING OF BENEFITS AND COSTS

There is debate in the health community as to whether it is appropriate to discount health benefits in the same manner as health costs. In the economics discipline it would be normal to discount both benefits and costs, particularly when both where expressed in monetary terms. The desirability of discounting non-monetary health benefits is less clear-cut.

This appendix has been compiled for those who subscribe to discounting of non-monetary health benefits. As in the main body of the paper costs after year 1 are discounted by 10% and benefits (the average number of life years saved) are discounted by 7%. This reduces the average number of life years saved per prevented cancer to 5.8 for women aged 20-34 years at diagnosis, and to 4.0 for women aged 35-69 years at diagnosis.

The effect of this discounting is shown for the average screening cost per year of life saved and on the marginal cost analysis per year of life saved. It is clear that application of discounting techniques to the benefits as well as the costs dramatically increases the cost of screening, particularly for women in the younger age group.

PRESENT VALUE OF THE AVERAGE COST PER YEAR OF LIFE SAVED

	SCREENING INTERVAL		
	1 year	2 years	3 years
Women aged 20-34 years	$50,910	$27,480	$18,375
Women aged 35-69 years	$25,658	$12,246	$7,798

PRESENT VALUE OF THE MARGINAL COST PER ADDITIONAL YEAR OF LIFE SAVED WITH SHORTENING OF THE SCREENING INTERVAL

	REDUCTION OF SCREENING INTERVAL	
	2->1 year	3->2 years
Women aged 20-34 years	$229,834	$209,579
Women aged 35-69 years	$1,207,113	$235,451

ROYAL AUSTRALIAN COLLEGE OF OBSTETRICIANS & GYNAECOLOGISTS
ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALIA
AUSTRALIAN MEDICAL ASSOCIATION
AUSTRALIAN SOCIETY OF CERVICAL PATHOLOGY AND COLPOSCOPY
AUSTRALIAN SOCIETY OF CYTOLOGISTS
AUSTRALIAN SOCIETY OF GYNAECOLOGICAL ONCOLOGY
CLINICAL ONCOLOGICAL SOCIETY OF AUSTRALIA

RECOMMENDATIONS

1. That the recommended interval between Pap smears be 12 months. Evidence indicates that, on average, women will attend every 2 years.

2. That the message should be uniform to all women of all ages.

3. That screening commence within 2 years of sexual activity.

4. That new strategies be implemented to reach those women who have never or rarely had a smear.

5. That strategies be implemented to reduce the false negative rate of Pap smears. Takers of smears and cytotechnologists require adequate training.

6. That women and health providers be educated that the Pap smear is a screening test for healthy asymptomatic women. Patients with symptoms, e.g. abnormal bleeding, should be referred to a gynaecologist.

7. That training of gynaecologists in conservation outpatient management of precursor lesions be improved and formalised (i.e. colposcopy, laser, electrodiathermy, cryosurgery).

8. That systems of call and recall of women to the scheme be instituted. A prolonged discussion on frequency rates seems futile whilst ever the bigger administrative problem of call and recall is not solved.

9. That the impact of these screening recommendations on cancer incidence and mortality be closely monitored and reviewed at a later conference.

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB, BS, Hon. LL.D, FRACP, FRACMA

Anti-Cancer Council of Victoria

20 May 1988

49-386

Dr. C.M. Taylor
General Practitioner
Ouyen 3490

Dear Dr. Taylor,

Sheila Hirst has passed on your note about the possibility of setting up a clinic for HPV infection in Mildura.

I'm sorry to be rather late replying - I've been out of the office quite a lot.

It's not quite clear to me why HPV infection would not be covered as any other infection would.

Our general policy is not to get involved with the Medical Benefits Schedule as we are not a treatment organisation. I could overturn this policy but couldn't undertake to process the issue rapidly. I imagine also that the government's response would be there is provision for management of male HPV infection in STD clinics which are program funded. Perhaps you can correct me on this.

Yours sincerely,

Nigel Gray
Director

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: ACCV AA 34158

Anti-Cancer Council of Victoria

Education Unit

Memorandum

Date: 27 April 1988

From: Sheila Hirst

To: Nigel Gray

Subject: Letter from Dr C M Taylor

The attached letter has been sent to me with regards to a revision of the Medicare Benefits Schedule. Can you handle this or can you direct me to the appropriate person?

Unfortunately the letter came with a standard form re the cervix campaign and was opened by a volunteer. Hence I have only just discovered it.

Thanks

Sheila

Sheila Hirst

CX-MSH-03:er

Sheila - this is not an unreasonable idea - I will ~~could you~~ acknowledge & say we are considering it.

N G

M. Taylor
M.B., B.S. (Qld.)
General Practitioner

Cuyen
Victoria 3490
(050) 92 1198

31.3.88

Sheila Hirst
Education Officer
Anti-Cancer Council of Victoria
Keogh House
1 Rathdowne St
Carlton South. 3053

Dear Miss/Mrs Hirst,

Thank you for your letter of 28 March. I would be quite happy to be involved in this cervical cancer screening programme. The reason for this letter is to ask for the assistance of the Anti-Cancer Council in a related area, and you may even wish to include this topic as being related to cervical cancer. The field in question is that of HPV infection in the male partner of women who have HPV infection, CIN, or cervical cancer. You are possibly already aware that 80% of male partners of affected women are also infected with the virus, which causes a corresponding range of conditions in the male, from dysplasia to PIN to carcinoma of the penis.

The possibility of setting up a clinic in Mildura has been discussed with Dr John Bowditch (gynecologist) and it is envisaged that such a clinic will initially be run on a monthly basis in conjunction with Dr Bowditch's colposcopy clinic. My role would be to assess the male partners with a colposcope also. This is a new service in a new field and as such there is no item number or description in the Medicare Benefits Schedule. As it is conceivable that most patients will wish to claim benefits for the service, I have approached the Medicare Benefits Schedule Revision Committee through the Royal Australian College of Ostetricians and Gynecologists, and the Royal Australian College of General Practitioners to make an application on my behalf to the committee requesting that equvalent item numbers, descriptions, and fees be established for the examination of male patients. The item numbers for examination of the female genital tract are 6415 and 6483. There is no provision for examination of the male genital tract.

New items will only be incorporated into the Medicare Benefits Schedule when application is made by an association, individual applications being rejected. Hence this request to the Anti-Cancer Council, that an application be made on my behalf to the Revision Committee that men may also receive an assessment and treatment. I would like to estblish this clinic as soon as possible, and your urgent consideration of this request would be appreciated.

Thank you for your help.

Sincerely,

. M. Taylor
A.B., B.S. (Qld.)
General Practitioner

Puyen
Victoria 3490
(050) 921198

The Medicare Benefits Schedule Revision Committee may presumably be reached through the

Health Insurance Commission
Medibank House
460 Bourke St
Melbourne 3000.

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB, BS, Hon. LL.D, FRACP, FRACMA

Anti-Cancer Council of Victoria

24 May 1988

49-394

Mr L.A. Wright
Executive Director
Australian Cancer Society
G.P.O. Box 4708
Sydney 2001

Dear Lawrie,

Thanks for your note enclosing the draft program of the meeting on cervical screening.

I have noted my slot on the program and will be prepared.

Cheers.

Yours sincerely,

Nigel Gray
Director

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: ACCV AA 34158

Cancer Society interests

1. Who dies
Who gets sick
where are we losing

Screening interval is a concept of interest to the willing + informed.

350 deaths 1000 cases.
70 over years - half before 70

Its dynamic - up in 78-80 + down since
No increase in HPV. 1986-1987

The high risk is the never screened
Not the behaviour group of

Relative protection nil after 10 years

Heather
Screening half the 30-50
1/4 -> 1/4 of 60+
Deaths 75% - never screened at vets

IARC 10 years screening -> 64% reduction
1 year -> 93%

10% rapid onset

$ with screen
1 year screen 174 million dollars
5 year 29 million

Q. - Is annual or even biannual screening possible

Get F Murray found of J Li

Rob R - 1/3 regress

Cervix Summit

AUSTRALIAN CANCER SOCIETY INC.
A & C Building, 500 George Street, Sydney. Telephone (02) 267 1944
GPO Box 4708, Sydney, NSW. 2001. Australia. FAX: (02) 261 4123
Telex: AA 71036. Telegraphic address: Austcancer Sydney

Patron: His Excellency the Right Honorable Sir Ninian Stephen, AK, GCMG, GCVO, KBE.

B111/5.2.

July 22 mtg

May 4, 1988.

Dr Nigel Gray
Director
Anti Cancer Council
of Victoria
1 Rathdowne Street CARLTON SOUTH VIC

Dear Dr Gray,

I have pleasure in enclosing a draft program for a consensus conference to be held in Melbourne on 22 July 1988 to prepare recommendations for Government and all interested parties on screening interval for cancer of the cervix and related matters.

The cost of mounting the conference is underwritten by a Commonwealth Government grant and representatives of Government, (both Federal and State), Medical Colleges and Associations, Public Health bodies and Cancer Councils and Consumer Groups will be invited to attend and contribute to the discussion.

You will note that you have been nominated to take an active part in the program and I am waiting to seek your availability to participate on the day and acceptance of the role allocated to you.

Would you please reply to this office at your earliest convenience to confirm your attendance. Enquiries regarding the content of the program should be directed to the Convenor, Mr Brian Fleming, on (03) 347 5144.

With best wishes,

Yours sincerely,

L.A. Wright,
Executive Director.

cc: Mr W. Fleming
Ms L. Newby

-9 MAY 1988

AUSTRALIAN CANCER SOCIETY

Cancer of the Cervix

CONSENSUS CONFERENCE ON SCREENING RECOMMENDATIONS

ANTI CANCER COUNCIL of VICTORIA

Melbourne, Friday, July 22. 1988

8.45 am. - 4.00 pm

Thursday night fly - in and block booking at Rathdowne Motel

Assumption is that cancer of the cervix is a numerically important and preventable cancer and that population screening with the Pap. smear is feasible and desireable .

AIM

To arrive at agreed screening recommendations for all women, or specific recommendations for subgroups of women for the guidance of all contributing bodies.
To resolve the issue in practical terms based on epidemiology, pathology, practicality, ethics and cost.

(What should be done with detected lesions is a separate issue)

PROGRAM

1. **INTRODUCTION.**

The expected outcome of a screening program is prevention of cancer by detection of premalignant lesions, or an observed reduction in mortality from the target cancer in the screened population, not simply case detection.

8.45. Chairperson: 10 min.

2. **THE FACTS**

The epidemiology of cancer of the cervix and premalignant conditions in Australia. Actual numbers as well as incidence in various age and ethnic population groups. Trends and expected changes. What is the size of the potential population to be screened? Basis for intervals in established overseas programs.

Facts about progression to cancer and resolution of untreated premalignant lesions. Relationship to epidemiology of wart virus infection. Will early detection of the aggressive cancer in young women lower the mortality in this group. What do studies of the Victorian Cytology Service reveal?

Three speakers.

8.55 Prof. Bruce Armstrong "Epidemiology". 20 min.

9.15 Dr. Robert Rome "Overview of pathology and relation to wart virus". 15 min.

9.30 Dr. Heather Mitchell "Deductions from a review of the Victorian Cytology (Gynaecology) Service." 30 min.

(These papers to be circulated before the meeting)

10.00 Discussion - Interpretation of facts. 10 min.

3. RECOMMENDATION

At this stage , from the facts presented, the epidemiologists will be asked to make their recommendations as a basis of discussion for the rest of the conference.

10.00 Prof. Bruce Armstrong to present these. 5.min.

COFFEE BREAK
10.05 - 10-30

4. RESPONSIBILITY

What is the moral responsibility of the screeners to detect all premalignant lesions and/or cancers? What should be the standards and the expectations of the community and the public health authorities, that every cancer be prevented, or the great majority? Does the level of responsibility to detect differ between dedicated screening clinics dealing with a population and the doctor's surgery when an individual woman requests a health check? Should doctors be resonsible for initiating the checks?

10.30 Ms. Margaret Peters "Womens expectations" 10 min.

10.40 Dr. Robin Marks " Cancer public educators view" 10 min.

4. SCREENING RECOMMENDATIONS

Should there be one interval for all, or should there be different protocols for specific subgroups of women? Does it depend on age, pathology of initial smears, sexual behaviour?

What difficulties would the choice of multiple protocols place on public and professional education?

If for reasons of cost it is too expensive to screen every woman frequently from beginning of sexual activity, is it feasible to choose a few particular ages on which to target major education and recruiting campaigns and expect to pick up the majority of cases? Would this be ethical?

When should screening start and stop?

Is there a case for special broader based approach for the younger sexually promiscuous women, if such were feasible, and then start cervical cancer screening alone at a later age for all women?

What are the obstacles to performance of Pap. smears in routine practice and to recruitment to screening programs?

Speakers to address appropriate aspects of these topics.

10.50 Dr. Malcolm Coppleson (Gynaecologist) 15 min.

11.10 Prof.Robert Sanson-Fisher (Behavioural scientist) 15 min.

11.30 Ms. Elaine Henry (Director, NSW Cancer Council) 15min.

11.50 Dr. Paul Nisselle (General practitioner and ABC radio medical commentator 15 min.

12.10 Mr. Rob Carter (Health economist, A.I.H.) 15.min.

LUNCH

12.30 - 1.30

It is intended to appoint a Concensus Panel to draw the final conclusions from the meeting. The Chairperson of the Panel will present their recommendations. Panel to meet over lunch (at ACCV) for preliminary discussion.

Panel Members:

Chairman Ms. Elaine Henry A.C.S.
Dr. Keith Free C.O.S.A & R.A.C.O.G.
Prof. Margaret Davy R.A.C.O.G
Ms.Cathy Meade NH&MRC
Dr. Judith Lumley Epidemiologist
Dr.Gabriele Medley Pathologist
Dr. David Hill Behavioural scientist
CONSUMERS HEALTH FORUM

DISCUSSION FROM THE FLOOR

1.30 - 3.15

When invitations are extended , individual invitees and organisations will be offered the opportunity to submit brief prepared comments for inclusion in the final program, or for tabling at the meeting at the organiser's discretion.

1.30 Discussion opener Dr. Nigel Gray "Should Cervix screening be considered in isolation."

COFFEE BREAK

3.15 - 3.30

Consensus Panel to prepare final recommendations.

CONCLUSIONS

3.30 Chairperson of Consensus Panel

4.00 Meeting concludes

Recommendations to be fowarded particularly to AHMAC, NH&MRC , State and Territory Cancer Councils, Commonwealth and State Health Depts. as well as contributing bodies.

Tape.
Here's a suggest file.

Invitation list: 3
A.H.M.A.C. (~~Two~~, representing State & Territory Dept. of Health)
Commonwealth Dept. of Community Services and Health – 2
N.H.& M.R.C.
C.O.S.A. (Gynaecology Group)
State and Territory Cancer Councils
R.A.C.O.G.
R.C.P.A.
R.A.C.G.P.
Australian Institute of Health
Australasian Epidemiological Ass.
Australian Society of Cervical Pathology and Colposcopy
Australian Society of Cytologists
Australian Society of Gynaecological Oncologists
Public Health Association of Australia and New Zealand
Consumers Health Forum – 3
Family Planning Association
Royal Australian Nursing Federation
Australian Women's Health Network
Australian Medical Association

Invite organisations to nominate a representative, if not already speakers or Panel members at their expense. State cancer bodies to nominate representatives.

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB, BS, FRACP, FRACMA

Anti-Cancer Council of Victoria

21 April 1988

49-333

The Hon. M. Birrell MLC
Shadow Minister for Health
325 Camberwell Road
Camberwell 3124

Dear Mark,

Herewith your fascinating correspondence. It was a very enjoyable read.

I've attached a draft report of the Victorian Cytology Service. I don't think it's yet public because I'm not sure that it's actually gone to the Minister. However, there's nothing in it that's either sacred or secret. I'd be happy to discuss any issues you'd think might be relevant.

I'm not going to write a long briefing on cervical cancer at this stage because there are likely to be developments in the scientific position i.e. how often we would recommend women to have a pap smear, in the next six months. I'll make some comment to you when there are some developments.

I take your point about the Quit campaign and its negative aspects and also about the need for the Foundation to make sure that we get everybody involved. I'll go to work on those two issues.

I'll be in touch when there's something new.

Yours sincerely,

Nigel Gray
Director

Encl. Return papers, Draft report on Victorian Cytology Service

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: VCCG AA 34158

A member of the Australian Cancer Society
Director: Dr Nigel Gray A.M. MB, BS, Hon. LL.D, FRACP, FRACMA

Anti-Cancer Council of Victoria

13 July 1988

49-518

Dr. W. McCubbery
President
Australian Medical Association (Vic.)
Medical Society Hall
293 Royal Parade
Parkville 3052

Dear Bill,

I find myself substantially embarrassed by the attached press clipping. My understanding of what went on last Tuesday was as follows:

1. We had a preliminary meeting. I didn't regard it as confidential but certainly didn't expect to read about it in the newspaper or the minutes of a senate enquiry.

2. The conclusion of the meeting was that we should examine the legislative possibility that doctors who choose to notify pap smears to a central registry would be granted **immunity.**

3. I thought it was crystal clear that there was no suggestion of a computer being kept at the Health Department. I indicated that the protection against manipulation of this type of file was the institution set up to run it and that this would be an appropriate board.

Nevertheless I hope we can make progress with the issue next week and reach a common understanding of what is intended. It seems very likely that legislation providing immunity would be attractive to the government.

Yours sincerely,

Nigel Gray
Director

KEOGH HOUSE, 1 RATHDOWNE STREET, CARLTON SOUTH, AUSTRALIA 3053 ☎ (03) 662 3300
Facsimile: (03) 663 3412 Telex: ACCV AA 34158

TRANSMISSION REPORT

	ANTI CANCER VIC
TIME	7.13.1988 11:57
DURATION	1'27"
REMOTE ID	61 3 347 9871
MODE	G3
COMPLETED PAGES	2
RESULT	O.K.

st list plan

sister about this," he said yesterday.

"It's a question of who is going to have access to this and how you are going to be safeguarded."

Dr McCubbery said he was worried that other conditions checked in the same batch of tests — such as the presence sexually transmitted diseases — could find their way on to the computer.

He said there were all sorts of people who might have an interest in information on the computer.

This had been highlighted by the release of details of abortions performed on 20 Victorian women during the failed prosecution of a Melbourne gynaecologist.

The Council's education director, Dr Robin Marks, said yesterday details of the plan were still on the drawing board but the aim was supported by many women's groups.

He said many women, especially those who were older and were in lower income and non-English speaking groups, were not seeking checks.

According to recent estimates, 340 Australian women are dying of cervical cancer every year and another 1000 have such an advanced form of the disease that they are forced to undergo hysterectomies.

But pap smear tests can detect early signs of the cancer, allowing surgery to head off its spread.

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Cancer test list plan

AMA says privacy in danger

By DAN McDONNELL

A PLAN to step up the fight against cervical cancer has run into serious concern over its potential threat to privacy.

The Anti-Cancer Council wants to set up a central register of women who have had pap smear tests for early signs of the cancer.

The council would compare the register with the electoral roll to find the names and addresses of women who had never had a test so they could be sent letters urging they be checked.

But the Australian Medical Association has described the idea as a threat to privacy.

The AMA's state president, Dr Bill McCubbery, said the plan would make it compulsory for pathologists to register the names and addresses of those tested on a computer file, probably kept at the Victorian Health Department.

Dr McCubbery said women would have personal details recorded on the central list without their knowledge or any attempt to gain their consent.

Despite the good intentions of the plan, the AMA would not allow a computer file containing such intimate details to be set up without guarantees of privacy.

"There is an element of big sister about this," he said yesterday.

"It's a question of who is going to have access to this and how you are going to be safeguarded."

Dr McCubbery said he was worried that other conditions checked in the same batch of tests — such as the presence sexually transmitted diseases — could find their way on to the computer.

He said there were all sorts of people who might have an interest in information on the computer.

This had been highlighted by the release of details of abortions performed on 20 Victorian women during the failed prosecution of a Melbourne gynaecologist.

The Council's education director, Dr Robin Marks, said yesterday details of the plan were still on the drawing board but the aim was supported by many women's groups.

He said many women, especially those who were older and were in lower income and non-English speaking groups, were not seeking checks.

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MR. W. BRIAN FLEMING
M.S., F.R.C.S. (ENG.), F.R.A.C.S., F.A.C.S.

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PRIVATE CONSULTING SUITE.
THE ROYAL MELBOURNE HOSPITAL.
P.O. 3050. VICTORIA.

28 MAR 1988

26 March 1988

Dear Nigel

Enclosed is a suggested program drawn up after our meeting of 25 March.

I would be grateful if you would review the format and make suggested alterations. Please suggest speakers in the appropriate spots and help me with correct titles, institutions and addresses.

Kind regards

Brian

original sent 12 APR 1988

Bevan
Very good - only one comment - P.2.
Angell
28.3.88

AUSTRALIAN CANCER SOCIETY

Cancer of the Cervix

CONSENSUS CONFERENCE ON SCREENING INTERVAL

ANTI CANCER COUNCIL of VICTORIA

Melbourne, Friday, July 29 1988

9.00 am. - 4.00 pm

Suggest Thursday night fly -in and block booking at Rathdowne Motel

Assumption is that cancer of the cervix is a numerically important and preventable cancer and that population screening with the Pap. smear is feasible and desireable .

AIM

To arrive at a recommendation for an agreed screening interval for all women, or specific intervals for subgroups of women for the guidance of all contributing bodies.
To resolve the issue in practical terms based on epidemiology, pathology, practicality, ethics and cost.

(What should be done with detected lesions is a separate issue)

PROGRAM

1. INTRODUCTION.

The expected outcome of a screening program is prevention of cancer by detection of premalignant lesions, or an observed reduction in mortality from the target cancer in the screened population, not simply case detection.

9.00. Chairperson: ? 10 min.

2. THE FACTS

The epidemiology of cancer of the cervix and premalignant conditions in Australia. Actual numbers as well as incidence in various age and ethnic population groups. Trends and expected changes. What is the size of the potential population to be screened? Basis for intervals in established overseas programs.

Facts about progression to cancer and resolution of untreated premalignant lesions. Relationship to epidemiology of wart virus infection. Will early detection of the aggressive cancer in young women lower the mortality in this group.

9.10 Prof. Bruce Armstrong 30 min.

What do studies of the Victorian Cytology Service reveal?

9.40 Dr. Heather Mitchell 20 min.

(These papers to be circulated before the meeting)

3. RECOMMENDATION

At this stage , from the facts presented, the epidemiologists will be asked to make their recommendations as a basis of discussion for the rest of the conference.

10.00 Prof. Bruce Armstrong to present these. 10.min.

COFFEE BREAK

10.10 - 10-30

4. RESPONSIBILITY

What is the moral responsibility of the screeners to detect all premalignant lesions and/or cancers? What should be the standards and the expectations of the community and the public health authorities, that every cancer be prevented, or the great majority? Does the level of responsibility to detect differ between dedicated screening clinics dealing with a population and the doctor's surgery when an individual woman requests a health check? Should doctors be encouraged for initiating check-ups.

10.30 Womens health advocate,? Canberra 10 min. ✓

10.40 Gynaecologist or general practitioner ✓
10 min.

4. SCREENING INTERVAL

Should there be one interval for all, or should there be different protocols for specific subgroups of women? Does it depend on age, pathology of initial smears, sexual behaviour?

What difficulties would the choice of multiple protocols place on public and professional education?

If for reasons of cost it is too expensive to screen every woman frequently from beginning of sexual activity, is it feasible to choose a few particular ages on which to target major education and recruiting campaigns and expect to pick up the majority of cases? Would this be ethical?

When should screening start and stop? ✓

Is there a case for special broader based approach for the younger sexually promiscuous women, if such were feasible, and then start cervical cancer screening alone at a later age for all women?

What are the obstacles to performance of Pap. smears in routine practice and to recruitment to screening programs?

Speakers to address appropriate aspects of these topics.

10.50 Dr. Malcolm Coppleson (Gynaecologist) 15 min. ✓

11.10 Prof.Robert Sanson-Fisher (Behavioural scientist) 15 min. ✓

11.30 Elaine Henry (Director, NSW Cancer Council) 15min. ✓

11.50 General practitioner 15 min. ✓

12.10 Health economist ✓
15.min. (Times allow for 5 min. of question of fact after each speaker.)

LUNCH RATHDOWNE MOTEL

12.30 - 1.30

It is intended to appoint a Concensus Panel to draw the final conclusions from the meeting. The Chairperson of the Panel will present their recommendations. Panel to meet over lunch (at ACCV) for preliminary discussion.

Panel Members:	Prof Margaret Davy	College
	Elaine Henry	ACS
	Cathy Meade	NH&MRC
	Epidemiologist	
	Womens advocate	

DISCUSSION FROM THE FLOOR

1.30 - 3.15

When invitations are extended , individual invitees and organisations will be offered the opportunity to submit brief prepared comments for inclusion in the final program, or for tabling at the meeting at the organiser's discretion.

1.30 Discussion opener Dr. Nigel Gray

COFFEE BREAK

3.15 - 3.30

Consensus Panel to prepare final recommendations.

CONCLUSIONS

3.30 Chairperson of Consensus Panel

4.00 Meeting concludes

Recommendations to be fowarded particularly to AHMAC, NH&MRC , State and Territory Cancer Councils, Commonwealth and State Health Depts. as well as contributing bodies.

Invitation list: Invite with offer of expenses and accomodation.

a. Speakers and Panel members

b. Identified discussants who should be present.

Invite organisations suggested in Bruce Armstrong's letter to nominate two representatives of their choice, if not already speakers or Panel members at their expense. State cancer bodies to nominate representatives.