

Development of computerised Call-Recall system for national population-based to perform Cervical Cancer Screening and Prevention Control Program

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This paper discuss the possibility of a simple ,relatively a user-friendly, computer-driven system in encouraging female patients who had not have a Pap test within the preceding years to come in for screening. And also help in the evolution of public awareness and the development of a strong movement toward a domestic ban, if the incidence of cervical cancer is reduced, the savings in treatment and long-term care will quickly result in a net cost savings to the health care system. This type of application program is most likely to be used in a population-based screening program for this province.

Keywords: Pap smear, Cervical Cancer, Call-Recall System, Follow up process.

1. Introduction

Screening is a public health service in which members of a defined population, who do not necessarily perceive they are at risk of, or are already affected by a disease or its complications, are asked a question or offered a test, to identify those individuals who are more likely to be helped than harmed by further tests or treatment to reduce the risk of a disease or its complications (Bernard, 2005).

Cervical screening is not a test for cancer. It is a method of preventing cancer by detecting and treating early abnormalities that, if left untreated, could lead to cancer in a woman's cervix (the neck of the womb). The first stage in cervical screening is a smear test. A sample of cells is taken from the cervix for analysis. Early detection and treatment can prevent 80 to 90 percent of cancer developing. Cervical screening began in Britain in the mid-1960s. Although many women were having regular smear tests by the mid-1980s, there was concern that those at greatest risk were not being tested and that those who had positive results were not being followed up and treated effectively. Cervical Screening Program was set up in 1988 when the Department of Health instructed all health authorities to introduce computerised call-recall systems and to meet certain quality standards.

To improve results, cervical cancer screening programs need to be organised, from inviting the eligible women to do the Pap smear is acknowledged as the important first step in a series of connected functions, all necessary to provide full protection for the woman.

2. Background

Cervical cancer is a serious health issue. Many studies show that cervical cancer has now become the second most common cancer among women in the world, with up to 500.000 new cases/year and up to 300.000 premature deaths a year. It is the most common female cancer in large areas of the developing world where an estimated 80% of new cases arise. (Bernard, 2005; IRAC, 2004; Buehler, &Parsons, 1997).

Although cervical cancer is one of the potentially most preventable malignancies (Because of the long preclinical period cervical cancer, can be prevented by screening, diagnosis, and treatment.), it is still fairly common. In settings with established screening programs, increased compliance is important for future reduction in cervical cancer incidence, but it is presently unclear how this can be effectively achieved. To this end many studies and activities have been undertaken all over the world in order to ensure and maintain the effectiveness of the call-recall system to improve the uptake of cervical screening.(Anthony et al.,2003;Lieu et el ,1998; Julie et al.,1995).

As, studies show that during a large randomized trial demonstrates that relatively simple modifications of the call-recall system can drastically increase women's motivation to attend Pap smear screening. Overall, almost doubled the number of women participating in Pap smear screening and more than tripled the number of detected cytological abnormalities. Whereas reminders by letter and by phone both strongly increased the proportion of women attending (Sonja et al.,2004).

The modified invitation had only a small short-term impact, while it seemed to entail a somewhat higher long-term increase. The proportion of women attending screening increased by almost 10% after a reminder letter is send and by another 30% after the phone is followed up. An additional effect of the interventions was to increase the proportion of detected cytological abnormalities. Hence, efforts to increase attendance seem to reach those in greatest need for screening.

While other studies contended that computer-generated reminder systems significantly improves the delivery of preventive services as their results proved that the active (Telephone and letter) reminders ranked significantly higher rates of delivery (Ross, 1991).

Thus: Simple reminders by mail (computer generated letter) and phone can drastically increase women's participation in Pap smear screening and increase the number of detected precursor lesions and thereby save lives.

3. Current studies and challenges to over come

Studies (Sonja et al.,2004; Halarn et al.,1991) showed that although more women are being screened, some may be screened too often and efforts need to be directed to those who have never been tested. To this end, the system will develop a health promotion and disease awareness campaign. However, world experience has shown that the implementation of an organised cervical cancer-screening program has a high failure rate. (Andrea et al.,1989; Benson,2002).

Among the many causes of failure is the lack of a computerised information system to co-ordinate the work of the many involved facilities. Call-Recall system invites and encourages women to receive regular screening tests and to attend for initial and repeat (usually every three to five years) smear tests as part of the national cervical screening programs.

Also studies (Grunfeld, 1997; Lieu et el., 1998; Robenson et al., 1989; Stephen et al., 2002; Benson, 2002) showed that there is number of major challenges that need to be overcome, which including multiple data sources requiring separate investigation and negotiations for access; variations in reporting terminology and coding; incompatibility or lack of computer systems; variation in legislation permitting data access and major financial, resource and time requirements.

Challenges that concern the population study:-

a) Lack of awareness and Low level of education

Communication difficulties exist for many people with low learning or educational level. Existing written and multimedia materials are often unsuitable for people with learning difficulties or low literacy levels. Thus Public and professional education to help early recognition of symptoms of cancer and the availability of national screening programs are vital parts of any comprehensive program for cancer care.

b)Non-English speaking

Effective communication with people whose first language is not English often requires additional time, support and sensitivity as well as simply translation. Anyone responsible for producing information directed at ethnic minority groups should be aware of the importance of cultural and religious issues. For example, health promotion letter cannot simply be translated from one language to another, but requires sensitivity to different cultural attitudes to health issues, interpretation of images and signs, etc.

c) Age Factor: older (65 or above) or younger (18-24)

d) Lack of access to a regular physician & Living in a rural /remote area

e) Some clinics may not have computers at all.

Future trends will try to prove and enhance the Call-Recall system to increase women's awareness of cervical cancer, eliminating unnecessary screening, improving the management and follow-up of abnormal results, reducing cervical cancers where preventable and implementing an automated quality control system. Thus, Call-Recall system will achieve its greatest potential to reduce mortality when large numbers of women are screened regularly. And also maintain and facilitate the flow of information between all departments that includes doctor's clinics where the smears are taken, cytology laboratories where the smears are processed, hospitals where diagnosis and treatment is confirmed, and cancer registries.

4. Development of the system

This proposed system attempts to introduce an open-source environment web-based by using the latest technologies. It will be able to communicate to a centralized aggregate database, Site Servers, and Internet communication to accomplish its objectives. The prototype development will focus on these aspects to provide fast, secure, accurateness and reliability.

The system will be developed in accordance with the workflow for the call-recall system as shown below. The Green-colored boxes shows the activities that involve Call-Recall system, while the yellow-colored boxes shows the activities that are performed by Primary care system or any third-party vendors' system. The non-colored boxes show activities that either need medical attention or need the patients' intervention.

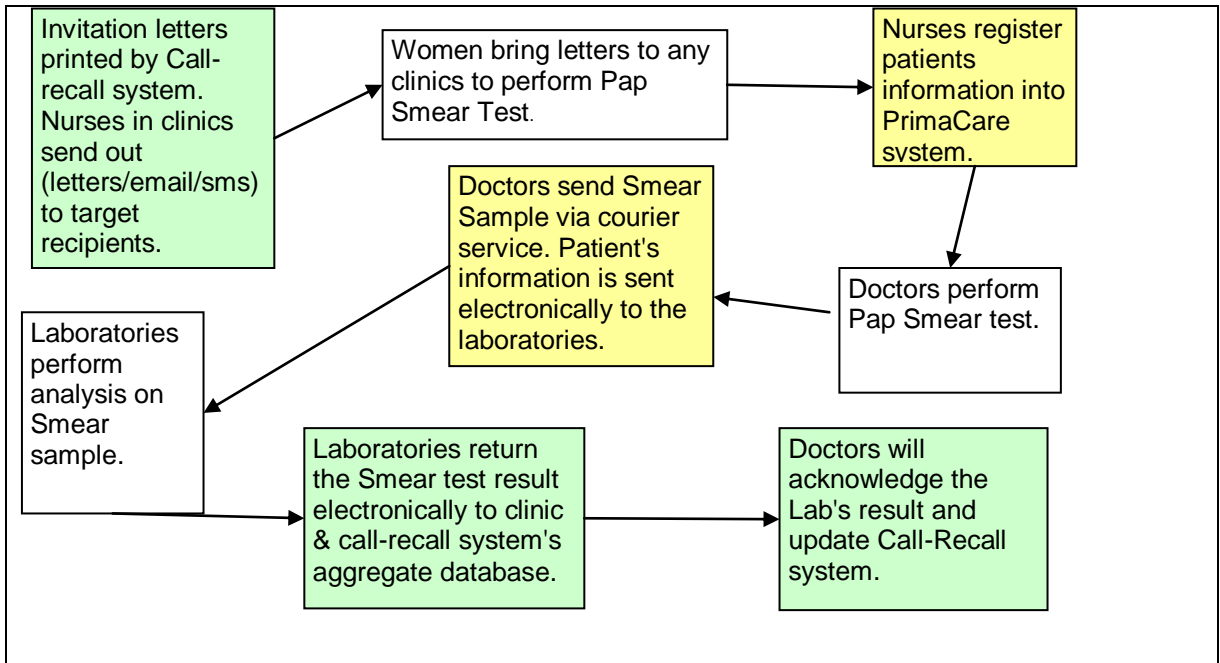


Fig1: *work flow for the call-recall system.*

5. Flow of Information in the Program

It should be noted that the work flow may change depending upon the agreed on protocols by the physicians involved in the program, and also upon the stage of the screening program's development. In the program depicted: The main task facing program operators is to encourage women to attend screening. The process of creating this demand is complex and unique to each country, and even each region within the country. For some customers invitation letters are considered effective, and a recruitment/recall module will be developed to support this function. In response to specific advertising campaigns and recruitment activities of the Program, women go to a doctor's office to have a Pap smear. In this first encounter, woman will be examined and registered into the information system. From this point forward the woman's progress through each stage of the screening program until the final resolution of her case, will be monitored by the system accompanied by the doctors or clinics staff. If the woman's result is normal, the woman exits the program. This is due to a program policy of one screen per lifetime in the first stage of program development as the quality of the health system infrastructure is being improved. Where service is already satisfactory, this workflow would be changed to reflect the program's recall schedule, often every three years. At that time, the system would automatically generate an invitation letter to encourage the woman to be screened again.

If the woman's result is abnormal, she is referred to the appropriate treatment facility accordingly to the stage of the detected pathology. The system generates a result report for signature by the presiding cytopathologist, which includes an appointment date, if required, for a repeat cytology at the doctor's office or for PapSmear at the clinic. This report is returned to the doctor's office for discussion with the patient. In addition a weekly agenda of appointments made by the system is sent to the referred facilities. If these facilities elect to be on-line with the system, the agenda can be sent electronically.

The system automatically generates a list of women who have not kept their appointment. Depending upon how the program is organised, this list is either generated by individual doctor's office and sent to the doctor to encourage the woman to reschedule and attend follow-up treatment, or the list is generated by region and sent to a centralised recruitment and retention Co-ordinator, who takes responsibility for contacting the woman on behalf of her doctor. Using this tool, loss to follow-up, a chronic problem in cervical cancer screening, can be greatly reduced.

6. Conclusion & Further Studies

Medicine today is seeing very rapid development of new technologies for the prevention, treatment and diagnosis of disease. These technologies help both health care - establishments to provide the best response to patient's needs in order to improve health care; and the health professionals to define and implement the best strategies for diagnosis and treatment in line with the prerequisites. That will fulfil their mission in implementing national and population-based Programmes of action against cancer. And such Call-Recall system can be used to remind women to attend mammography screening for early detection of breast cancer, or to attend Papsmear screening to detect any earlier possibility of cervical cancer it also can be used as Immunization reminder/recall systems which recent study show that they are cost-effective methods whereby children in need of vaccination are identified and contacted to come to the physician's office. Reminder systems track future appointments, whereas recall systems track missed appointments during which immunizations would have been given. Combining reminder and recall systems is a powerful method for ensuring optimal vaccination rates. New technologies (for example the use of email and SMS to enhance the reminder and follow up process) will bring new possibilities as well as challenges. But they will certainly change the face of primary care and will evolve the public health.

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