A REVIEW OF PERFORMANCE INDICATORS FOR EVALUATION OF CERVICAL CANCER SCREENING PROGRAMS

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Abstract: The aim of this review is to identify in the literature the performance indicators to evaluate the cervical cancer screening programs around the world. The literature search identified 25 articles reporting performance indicators in 21 countries/regions worldwide. A total of eight qualitative and 81 quantitative indicators was reported showing a huge variety in quantity of indicators reported by regions. The regions with the greatest life spam programs seem to use more types of indicators. This review made clear the need to increase the motivation of the programs, which already have information systems, to publish their indicators as well as improve the methods to generate new indicators.

Keywords: Cervical cancer, screening program, Pap smear test and performance indicators.

Introduction

Cervical cancer is the second most common type of cancer among women worldwide [1]. There are about 500,000 new cases and 250,000 deaths each year [2]. According to the Brazilian National Cancer Institute (INCA), 15,590 new cases of cervical cancer were estimated for Brazil in 2014 [3].

Among all malignant tumors, cervical cancer is the one that can be most effectively controlled by screening. Detection of cytological abnormalities by microscopic examination of Pap smears and subsequent treatment of women with high-grade cytological abnormalities can avoid the development of cancer up to 80%.

To achieve this level of reduction, the effectiveness of each phase of the screening program should be optimal [4, 5]. Therefore a screening program requires the monitoring of performance indicators for each of its phases. Despite the consensus about the importance of these indicators, there is a lack of knowledge about the quantity and diversity of these indicators.

The objective of this study is to review the literature in order to identify performance indicators used to evaluate cervical cancer screening programs around the world.

Materials and methods

The search was performed on the 25 databases of Biblioteca Virtual em Saúde (BVS) for articles listed prior to May 2014, following the search strategy described in Box 1. In addition to it, a Google search for gray literature was done with no language requirement. The title and abstract of the identified articles were checked regarding the inclusion criteria listed in Table 1. The full articles were obtained for those that met the inclusion criteria.

All studies about cost-effectiveness of the cervical cancer screening programs were excluded as well as duplicate articles.

Box 1. Search strategy

Table 1. Study inclusion criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
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<tr>
<td>Population</td>
<td>Cervical cancer screening programs</td>
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<td>Intervention</td>
<td>Performance indicators of cervical cancer screening programs</td>
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<td>2. Case reports</td>
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<td>3. Systematic reviews</td>
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The identified indicators were classified into two main groups, each one divided in subgroups as illustrated in Figure 1 [30, 32].

Results

Figure 2 summarizes the literature search and data selection process, showing that out of 632 articles initially identified 25 were selected.

A total of 89 performance indicators was identified in the literature of which 8 were qualitative, two per each group, and 81 were quantitative indicators. The latter ones were distributed among the seven groups as described below:

- **Participation and screening intervals** – This group contains 20 performance indicators. Those indicators were subdivided into 11 indicators for women participation in the program, 4 indicators for women rescreening of the Pap smear test, and 5 indicators for general administration of laboratories.
- **Quality of Pap smear test samples** – This group contains 3 indicators for the quality of cervical cell samples used for Pap smear test.
- **Incidence and mortality** – This group contains 6 indicators for mortality and incidence.
- **Screening history** – This group includes 3 indicators about screening history of women diagnosis with invasive cancer, squamous cell carcinoma and adenocarcinoma.
- **Screening test results** – 29 indicators related to all possible results of Pap smear test. These indicators were subdivided into 20 indicators for percentage of all results of abnormal findings, 3 for cancer detection; 4 for percentage of false positive tests and two indicators for ratio between the atypical squamous cells of undetermined significance (ASCUS) and number of atypical cell findings.
- **Follow-up of abnormal tests** – 13 indicators related to follow-up of all abnormal Pap smear test results that need to undergo further evaluation to determine whether the women need to be treated. Indicators of this group are mainly about the number of histology and biopsy tests and the treatment of intraepithelial lesions.
Colposcopy Test – This group includes 7 indicators related to the colposcopy test and its follow-up rates.

The 89 indicators were distributed among 21 countries/regions from all continents except Africa. Figure 3 shows that Europe and North America had the highest number and variety of indicators. All the qualitative indicators were used in the State of Georgia, USA [17].

The analysis of indicators per countries presented Canada (25), Australia (16), and Brazil (13) and Italy (11) as the ones with the highest number of indicators.

The most frequent groups of indicators were: participation and screening intervals; screening test results and incidence and mortality. In the case of Brazil, three out of the seven groups of indicators were not reported, which were follow-up of abnormal tests, colposcopy Test and screening history.

Figure 3 shows that Europe and North America had the highest number and variety of indicators. All the qualitative indicators were used in the State of Georgia, USA [17].

Discussion:

Cervical cancer is an important cause of morbidity and mortality among women worldwide. However, there is strong evidence that an effective prevention of this cancer can be provided by an organized screening program [16]. In order to evaluate a program, a set of performance indicators should be used to monitor the program actions.

This study identified many countries/regions with established screening programs, but with a large variety in the use of indicators. Moreover the regions with the greatest life spam programs seem to use more and diverse types of performance indicators (Figure 3).

It was observed that only three groups of indicators were reported by at least one country/region per continent and the qualitative indicators were only reported in Georgia [17].

These findings suggest the low concern of the programs to publish their indicators. Taking into account that the Brazilian screening program was established in 1998 and has its own information system for monitoring and management of the program actions [33], only four out of the seven groups of indicators were reported. Although the information system make available data to estimate indicators for follow-up of abnormal tests, colposcopy test and screening history, these were not reported in the literature [14, 19, 20, 24, 31].

This review made clear the immediate need for the developing countries which already have information systems to use more indicators and disclosure their performance indicators.

Acknowledgment

To TWAS-CNPq for financial assistance for the first author.

References


