

A Situational  
Analysis of

# cervical cancer


in Latin America &  
the Caribbean



**Pan American  
Health  
Organization**

Regional Office of the  
World Health Organization





A Situational Analysis of Cervical Cancer  
Latin America & the Caribbean

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# preface

Cervical cancer remains a major public health problem among women of the developing world, especially those in Latin America and the Caribbean. Although this disease is largely preventable, our collective efforts to implement prevention programs have not successfully reduced the burden of cervical cancer in the Region of the Americas.

Given this circumstance, the Pan American Health Organization (PAHO) recently has focused additional efforts on this disease and through its Chronic Noncommunicable Diseases Unit is working with Member States to strengthen their cervical cancer prevention and control programs, taking into account the challenges and opportunities that exist at the regional, sub-regional and national levels.

This 2003 analysis of cervical cancer in Latin America and the Caribbean provides information for public health professionals, policy makers and advocates involved in the development and management of cervical cancer prevention and control programs. It represents a synthesis of data and information derived from many sources, which include:

- Current published scientific literature in peer review journals;
- Proceedings of PAHO-sponsored workshops conducted in four sub-regions of Latin America and the Caribbean;
- Documents such as national program plans and cancer registry reports from specific countries obtained through their respective Ministries of Health or the PAHO/World Health Organization (WHO) Country Representatives or Technical Centers; and
- Publications and data from programs based at the PAHO Headquarters (Health Situation and Trend Analysis, Chronic Noncommunicable Diseases Program and Family Health).

It is imperative to make every effort to enhance the health of the women of our world, so they are better able to participate in the development as well as the political, social and economic fabric of their countries. A reduction in cervical cancer morbidity and mortality will represent a giant step toward achievement of these goals.

Sylvia C. Robles, MD., MPH. Chief, Chronic  
Noncommunicable diseases unit

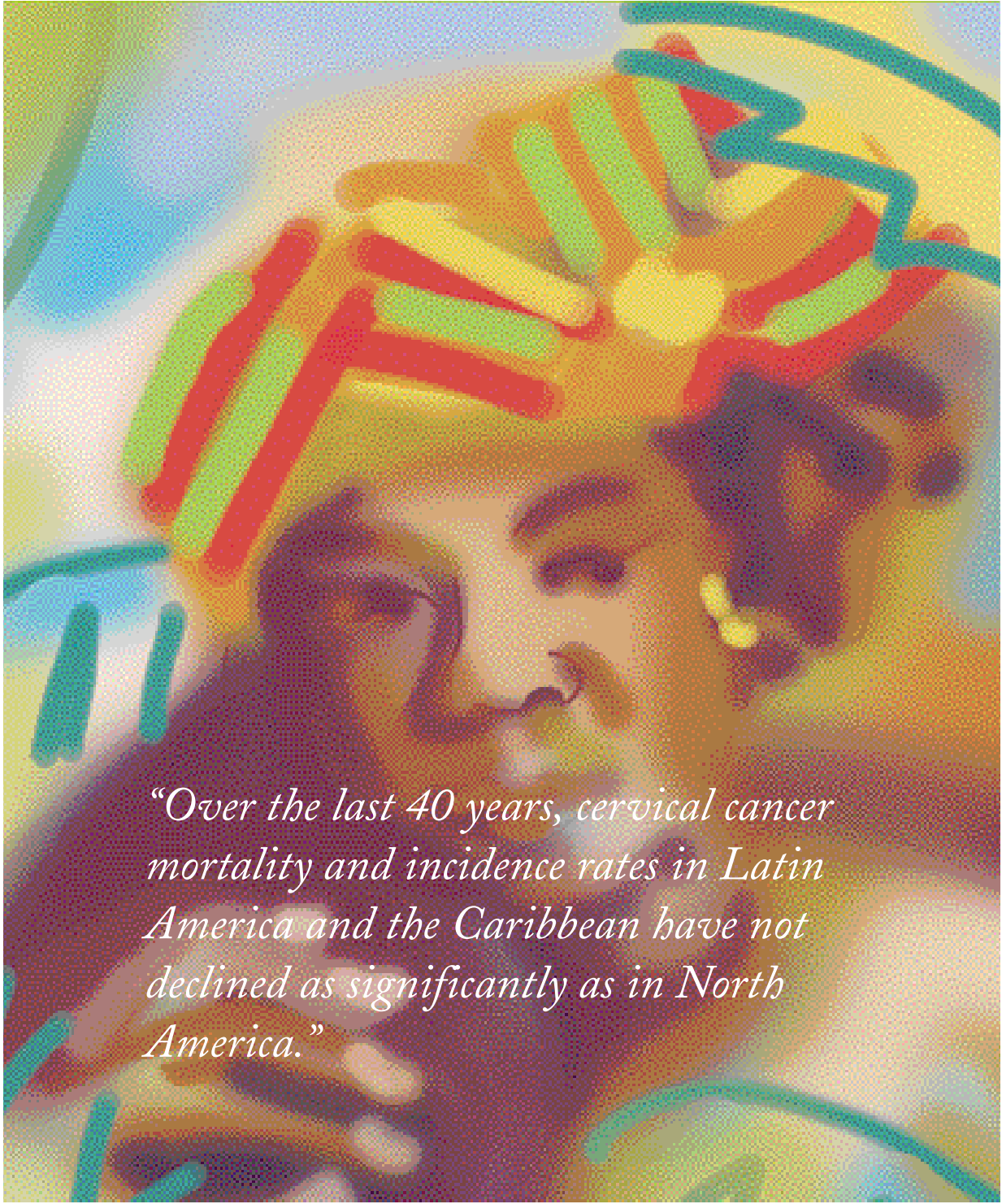


*“Cervical cancer is fully preventable and curable, at low cost and at low risk, when screening to facilitate the timely detection of early precursor lesions in asymptomatic women is available together with appropriate diagnosis, treatment and follow-up.”*

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*“Over the last 40 years, cervical cancer mortality and incidence rates in Latin America and the Caribbean have not declined as significantly as in North America.”*

# introduction

In 2000, it was estimated that 470,606 incident cases and 233,372 deaths due to carcinoma of the uterine cervix (cervical cancer) occurred annually among women worldwide, and that more than 80 percent of this burden is borne by less developed countries where cervical cancer is the leading malignancy among women.

For the Region of the Americas, it was estimated that 92,136 cases and 37,640 deaths would occur, with Latin America and the Caribbean accounting for 83.9 and 81.2 percent, respectively, of the total estimated cervical cancer cases and deaths.

Today cervical cancer remains a significant cause of mortality among women globally, even though it is the cancer with the greatest demonstrated potential for secondary prevention. This disease is fully preventable and curable, at low cost and low risk, when screening of asymptomatic women is available, together with appropriate diagnosis, treatment and follow-up. Yet prevention, screening and early detection programs in Latin America and the Caribbean have met with limited or no success.

In Mexico, where a screening program has been in place for more than 20 years, less than 13 percent of the potentially preventable cases have been averted. Similarly, in Costa Rica, none of the screening programs in place since 1960 has had an impact on incidence or mortality. In Cuba, where there has been a screening program since 1968, small increases in incidence and mortality have been observed, especially among young women.

When disease burden is measured in disability-adjusted life years (DALYs), with one DALY equal to the loss of one healthy life year, recent estimates from WHO suggest that in the Americas cervical cancer now accounts for 471,000 DALYs.

**Table 1**

## Malignant Neoplasm of the Cervix Uteri in the Americas

### Estimated Incident Cases and Deaths by Country with Age-Standardized Rates per 100,000 Population 2000

Country	Incident Cases	Deaths	Incidence Rate	Mortality Rate
Argentina	2953	1585	14.2	7.6
Bahamas	31	13	22.1	9.3
Barbados	54	27	30.4	13.6
Belize	30	11	39.6	16.8
Bolivia	1807	661	58.1	22.2
Brazil	24445	8815	31.3	11.6
Canada	1608	650	8.2	2.8
Chile	2321	860	29.2	10.6
Colombia	5901	2339	32.9	13.7
Costa Rica	424	197	25.0	12.1
Cuba	1586	730	23.8	10.6
Dominican Republic	1290	495	38.4	15.8
Ecuador	2231	892	44.2	18.6
El Salvador	1041	387	40.6	15.8
Guatemala	1432	566	39.6	16.8
Guyana	184	69	51.1	20.6
Haiti	2428	1326	93.9	53.5
Honduras	833	329	39.6	16.8
Jamaica	489	209	43.4	18.4
Mexico	16448	6650	40.5	17.1
Nicaragua	997	392	61.1	26.1
Panama	389	158	31.2	13.1
Paraguay	768	281	41.1	15.8
Peru	4101	1575	39.9	15.8
Puerto Rico	252	114	10.3	4.3
Suriname	77	31	43.8	18.2
Trinidad & Tobago	215	97	33.3	15.0
United States	13230	6417	7.8	3.3
Uruguay	307	163	13.8	7.6
Venezuela	3904	1454	38.3	15.2

Source: Ferlay et al: Globocan 2000, IARC



# an epidemiological profile

## Morbidity and Mortality

Latin America and the Caribbean have some of the highest cervical cancer incidence and mortality rates in the world, being only surpassed by East Africa and Melanesia.

Table 2

Malignant Neoplasm of the Cervix Uteri  
Age-Standardized Incidence and Mortality  
Rates Per 100,000 Population By Regions  
2000

Region	Incidence Rate	Mortality Rate
Eastern Africa	44.32	24.24
Melanesia	43.81	23.78
Central America	40.28	17.03
Caribbean	35.78	16.84
South America	30.92	11.97
North America	7.88	3.23

Source: Ferlay et al: Globocan 2000, IARC

## Trends in Incidence

Over the last 40 years, declines in cervical cancer incidence have resulted in significantly low rates of less than 10 cases per 100,000 females in Canada, the U.S.A. and other established market economies. However, in most countries of Latin America and the Caribbean, the annual rates of cervical cancer remain high, generally greater than 20 cases per 100,000 females.

## Trends in Mortality

Few countries in Latin America have demonstrated significant declines in reported mortality over the period of 1968 to 1993, in marked contrast to the North American experience. Available annual age-adjusted data from the Caribbean also suggests that cervical cancer mortality remains high in that sub-region, with an annual average of 25 deaths per 100,000 population.

Recent (1996-2001) PAHO mortality data indicates persistently high age-standardized cervical cancer mortality (ASMR) in Nicaragua, El Salvador and Peru. While mortality rates in some other countries appear lower, no individual country rate is as low as that reported for Canada, where an ASMR of 1.17 deaths per 100,000 females was noted for 2000.

Table 3

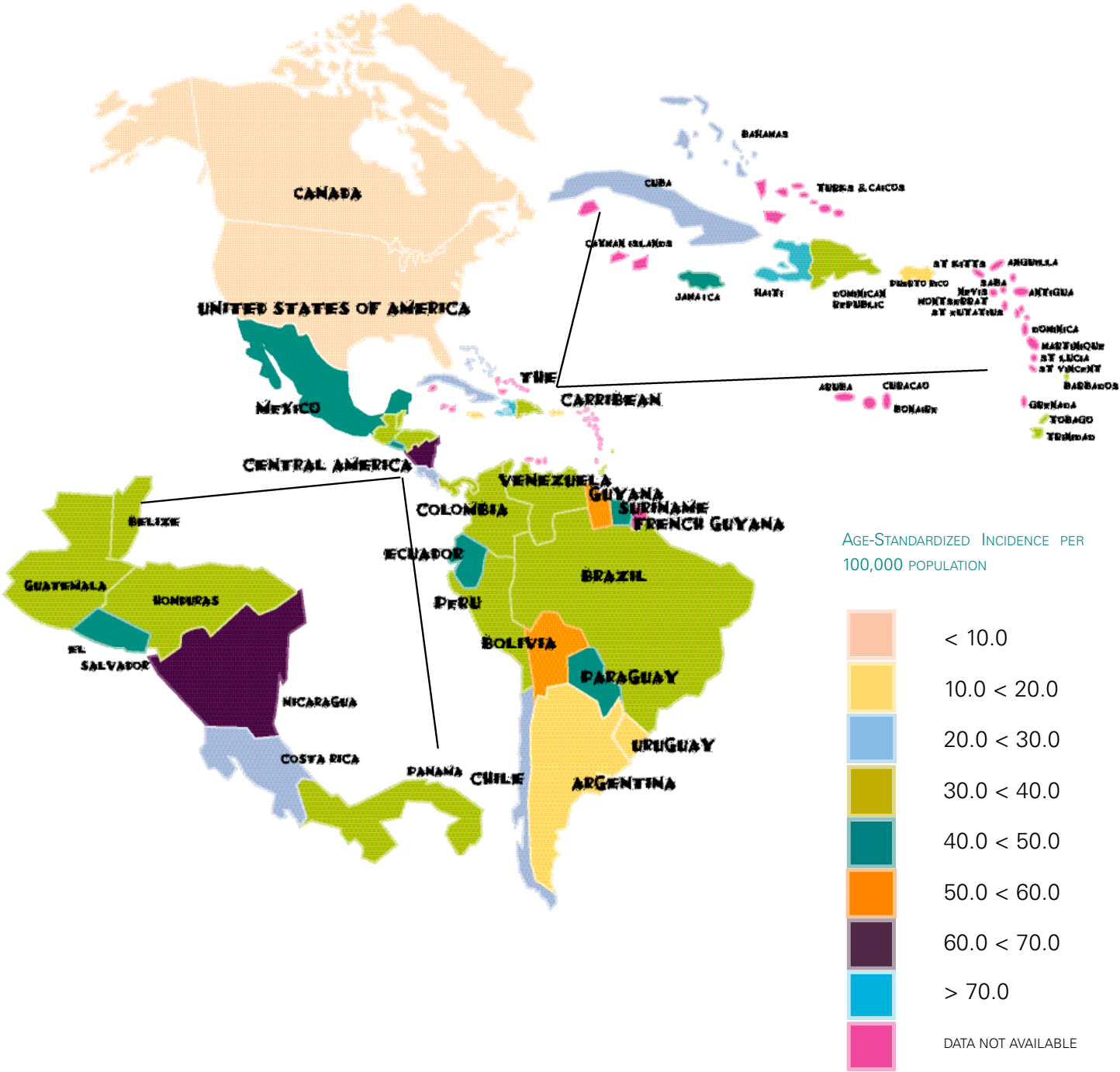
Age-Standardized Mortality Rates per  
100,000 Population in Some Latin American  
Countries 1996-2001

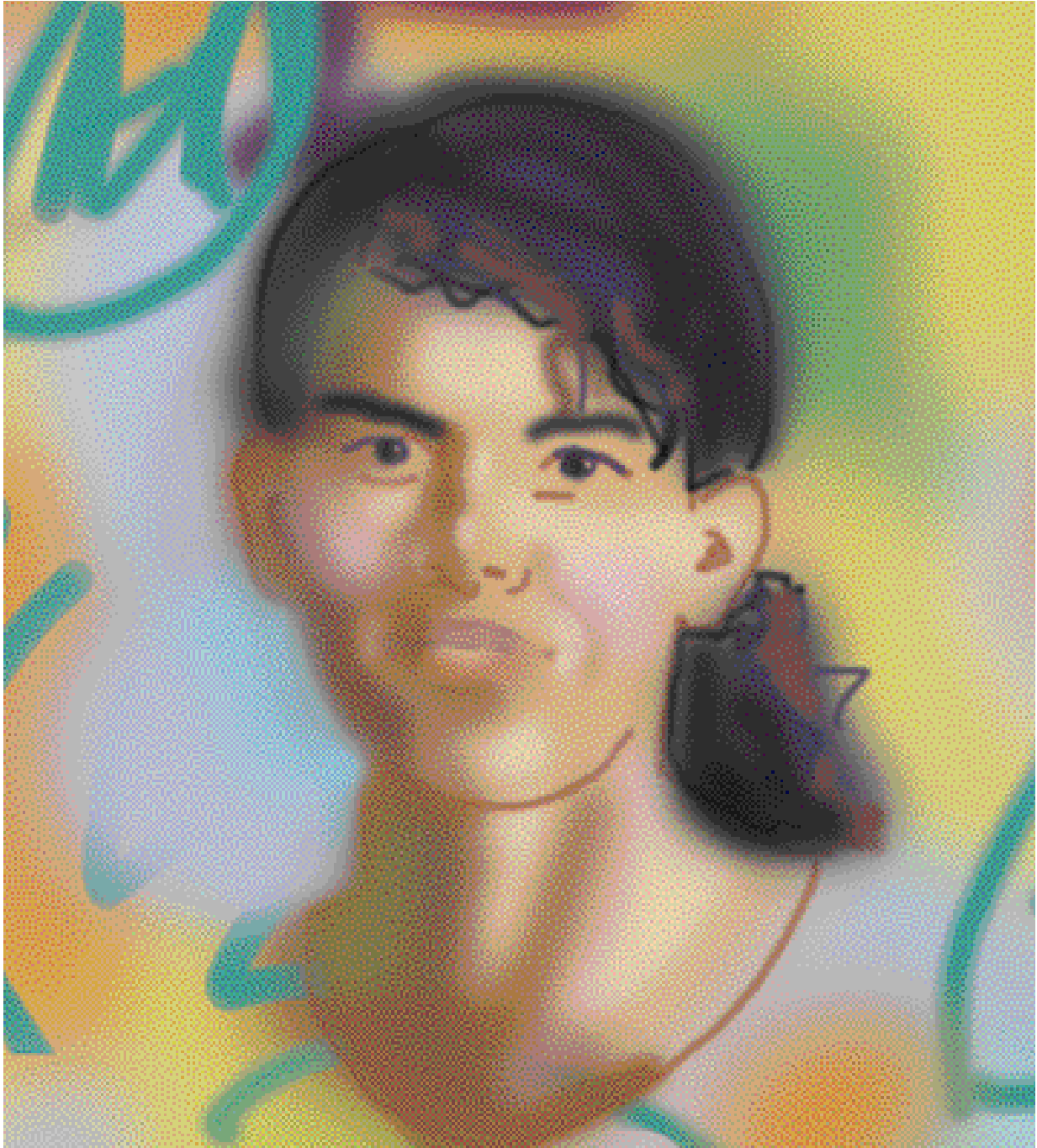
Country	ASMR 1996	ASMR 1997	ASMR 1998	ASMR 1999	ASMR 2000	ASMR 2001
Argentina	4.8	5.1	4.8	4.8	4.4	4.6
Brazil	6.7	7.0	7.3	7.6	6.9	
Chile	10.0	10.7	10.4	10.1	9.2	8.6
Colombia	13.3	12.8	13.3	13.3		
Costa Rica	10.1	10.2	10.0	8.7	8.0	8.8
Dominican Republic	9.0	8.2	7.3			
Ecuador	12.8	9.3	9.9	8.3	8.1	
El Salvador	13.3	11.2	20.1	18.8		
Mexico	13.2	12.9	12.7	12.6	11.9	11.4
Nicaragua	28.6	26.3	24.15	23.7	21.2	
Panama	14.0	13.3	14.2	15.7	11.7	
Peru	16.1	15.1	14.8	15.9	15.9	
Venezuela	11.4	10.6	10.2	11.6	9.3	

Source: Pan American Health Organization, Health Analysis and Information System Unit (AIS); PAHO Technical Information System



Cervical Cancer Incidence Rates in North, Central, South America and the Caribbean





## Potential Years of Life Lost

Cervical cancer deaths throughout the Region of the Americas account for a large number of potential years of life lost. In 1995, 6,065 women aged 35-64 died from cervical cancer in 16 countries, resulting in the loss of 183,487 years of potential life, assuming a life expectancy at birth of 75.8 years.

Based on more recent data provided to PAHO, 74,855 women from 13 Latin American countries died from cervical cancer between 1996-2001. Of these, 50,032 were 25-64 years of age, and their premature deaths resulted in more than 1.56 million years of potential life lost.

## Proportional Mortality

Cervical cancer accounts for a greater proportion of cancer deaths among women in Latin America and the Caribbean than in North America. When deaths from all malignant neoplasms (excluding skin) among women in the Americas are considered, the proportional mortality due to cervical cancer varies from less than 2.5 percent in North America to 49.2 percent in Haiti.

## Incidence-to-Mortality Ratios

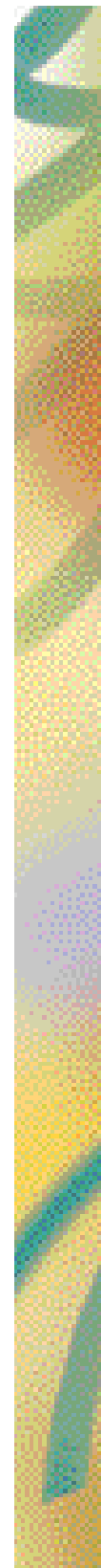
Incidence-to-mortality ratios for cervical cancer in most countries in Latin America and the Caribbean generally appear stable at around 2:3, with Haiti being the lowest at 1:7. While high incidence-to-mortality rates may reflect high survival among cancer patients, under-registration of cervical cancer deaths could also result in higher-than-expected ratios. Low case-ascertainment resulting from variability in diagnostic precision or the lack of appropriate registration of cancer cases as well as higher incidence rates may also impact the magnitude of this parameter. However, low incidence-to-mortality ratios may reflect high case-fatality rates as well as real differences in incidence.


Table 4

Cervical Cancer Deaths as a Proportion of All Deaths due to Malignant Neoplasms<sup>1</sup> among Women by Country  
Year 2000 Estimates

Country	Total Deaths due to Neoplasms	Cervical Cancer Deaths	Percentage
Argentina	24,657	1,585	6.4
Barbados	201	27	13.4
Brazil	72,833	8,815	12.1
Chile	9,045	860	9.5
Colombia	17,467	2,339	13.4
Costa Rica	1,593	197	12.3
Cuba	7,422	730	9.8
Dominican Republic	2,428	495	20.4
El Salvador	2,556	387	15.1
Guyana	269	69	25.6
Haiti	2,693	1,329	49.2
Jamaica	1,337	209	15.6
Mexico	40,185	6,650	16.5
Panama	1,056	158	15.0
Suriname	141	31	22.0
Trinidad & Tobago	656	97	14.8
United States	268,965	6,417	2.4
Canada	30,400	650	2.1

<sup>1</sup>Excludes malignant neoplasms of the skin





*“In Latin America and the Caribbean, survival among women with cervical cancer is poor because they often present for attention when the disease is advanced. Inadequate supportive care and incomplete treatment also are linked to poor survival.”*

## Cancer Survival Rates

Cervical cancer survival rates are significantly lower in developing countries. In a multinational study undertaken by the International Agency for Research on Cancer (IARC), age-standardized five-year relative survival rates for cervical cancer [ASRS] ranged from 28 to 64.9 percent in 10 populations drawn from five developing countries, including Cuba. These analyses revealed significant differences between developing and developed countries regarding cervical cancer relative survival rates. Declining survival with increasing age was most marked for cervical cancer in all 10 registries reviewed in five developing countries.

In addition, the proportion of localized cervical cancer in the developing-country regions was (with the exception of Cuba at 44 percent) considerably lower than in the U.S.A. (54 percent) from 1986-1991. This indicates that poor survival in developing countries was partly due to the presence of advanced disease at the time of presentation.

Table 5

### Cervical Cancer Comparison of Age-Standardized Relative Survival Rates [0-74 years] United States, Europe and Five Developing Countries

Registry	Period	ASRS
USA, white	1967-73	58.7
USA, white	1974-86	68.2
USA, white	1986-91	70.1
Europe	1978-85	61.5
China, Qidong	1982-91	42.0
China, Shanghai	1988-91	61.9
Cuba	1988-89	54.3
India, Bangalore	1982-89	39.9
India, Barshi	1988-92	32.0
India, Bombay	1982-86	49.5
India, Madras	1984-89	56.7
Philippines, Rizal	1987	28.0
Thailand, Chiang Mai	1983-92	64.9
Thailand, Khon Kaen	1985-92	55.4

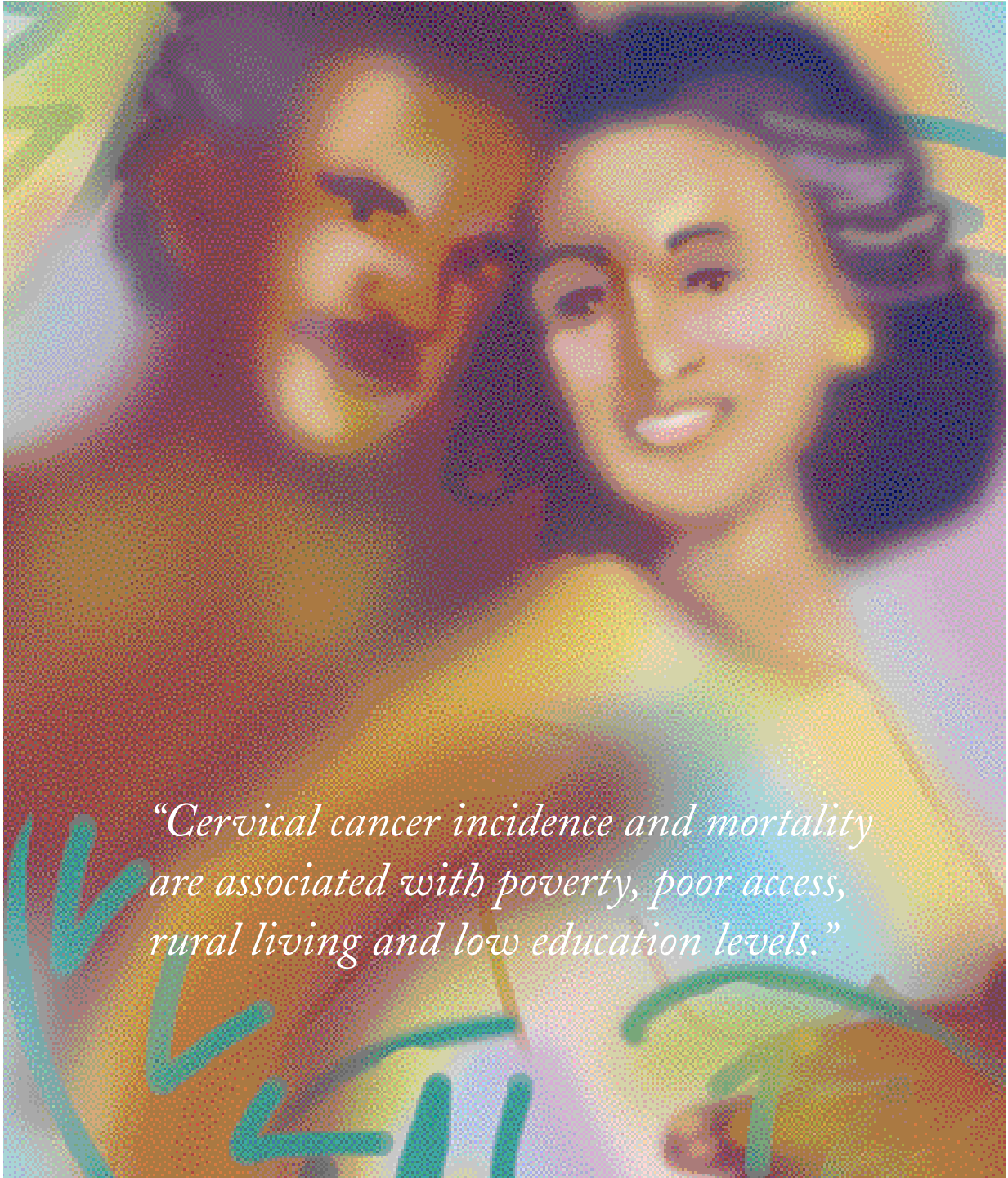
Source: Sankaranarayanan et al, 1998

## Variations in Incidence and Mortality Trends

Variations in cervical cancer incidence and mortality may be related to differentials in access and quality of services. Other impacting factors may include geographic location, socioeconomic status, education, and cultural and psychosocial issues.

In Ecuador, the highest cancer rates were found among the poorest individuals, and this was more pronounced among women, especially those in poor rural areas. In Costa Rica, higher rates of invasive cervical cancer were found in coastal areas, partially due to difficulties in access to screening programs and





*“Cervical cancer incidence and mortality are associated with poverty, poor access, rural living and low education levels.”*

problems related to diagnostic quality. In Bolivia, wide intra-country variations were linked to access, education and poverty. In Mexico, intra-country variations appeared linked to poverty levels, although it is unclear whether poverty is a major deterrent to access or whether health authorities have been unable to reach target populations in these areas.

In the near future, cervical cancer incidence and mortality are projected to rise as increased life expectancy will generate expanding numbers of older women. In Latin America and the Caribbean, it is estimated that deaths will increase to 42,000 and 52,000 in the years 2010 and 2020, respectively. Even more pessimistic projections suggest that 57,000 deaths could possibly occur by 2020.

## Epidemiological and Cancer Transitions

As overall mortality declines, breast cancer escalates among females while cervical cancer declines. In 1990, breast cancer deaths were already 8.6 times more frequent than cervical cancer deaths in the Established Market Economies, which include Canada and the U.S.A. In Latin America and the Caribbean, this transition can be seen in some countries such as Argentina, Uruguay and the Bahamas, where breast cancer incidence rates are many times higher than those for cervical cancer.

Conversely, cervical cancer incidence rates in Haiti are about 21 times greater than breast cancer, reflecting an epidemiological situation in which infectious diseases such as tuberculosis and AIDS remain predominant causes of morbidity and mortality. Though not as extreme, cervical cancer represents a greater disease burden than breast cancer in Bolivia and Nicaragua.

**Table 6**

Estimated Age-adjusted Incidence Rates Per 100,000 Women  
Breast and Cervical Cancers By Sub-region and in Selected Countries in the Americas 2000

Region	Breast Cancer	Cervical Cancer
Caribbean	33.8	35.8
Central America	36.2	40.2
South America	45.1	30.9
North America	90.4	7.9

Country	Breast Cancer	Cervical Cancer
Argentina	64.7	14.1
Bahamas	72.7	22.0
Bolivia	26.6	58.1
Brazil	46.3	31.2
Haiti	4.7	93.8
Mexico	38.4	40.4
Nicaragua	23.1	61.0
Suriname	29.7	43.7
United States	91.4	7.8
Uruguay	80.0	13.8

Source: Ferlay et al, 2001

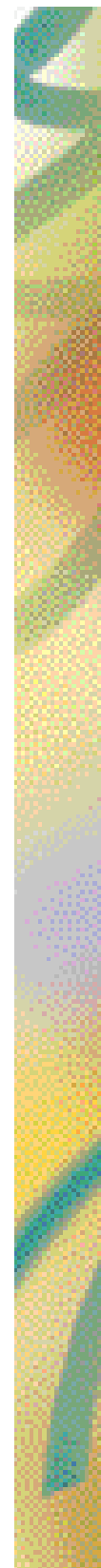


Figure 1

Malignant Neoplasm of the Cervix Uteri  
Estimated Age-specific Mortality Rates  
Per 100,000 Population  
Selected Regions of the Americas  
Globocan 2000

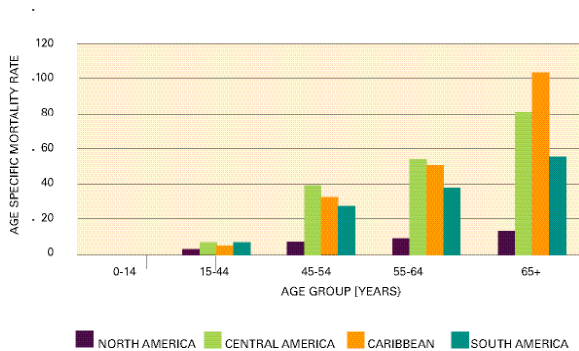
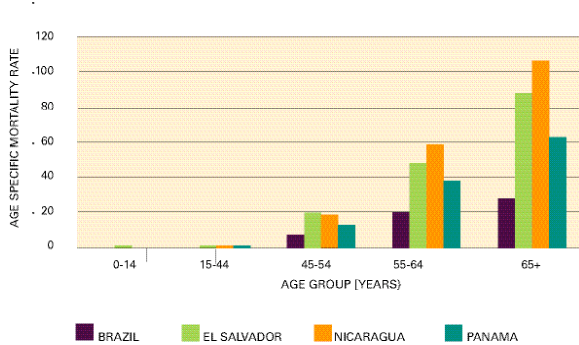


Figure 2

Cervical Cancer  
Age-specific Mortality Rates Per 100,000  
Females in Selected Latin American  
Countries  
1998



## Age Characteristics

As noted for other chronic diseases, cervical cancer incidence and mortality rates increase with age. An analysis of the age-specific mortality rates in four sub-regions of the Americas clearly demonstrates this trend. Age-specific mortality trends for individual countries also are similar to sub-regional patterns, despite differences in their individual national mortality profiles.

Although incidence and mortality rates increase with age, the greatest absolute burden of cervical cancer is borne by women in their middle years. A review of reported cervical cancer mortality data from countries in Latin America and the Caribbean indicates that women aged 35-54 repeatedly account for the greatest proportion of deaths annually.

## Human Papillomaviruses

A global body of evidence confirms that some genetic types of Human Papillomaviruses (HPV) play a necessary etiological role in cervical carcinogenesis. In addition to HPV-16 and HPV-18, recent international studies have expanded the listing of oncogenic viruses to include types 31, 33, 35, 45, 51, 52, 58 and 59. Globally, the prevalence of HPV in cervical carcinomas has been recorded at 99.7 percent, and oncogenic types 16 and 18 are the mostly frequently detected. Numerous studies have repeatedly confirmed the presence of HPV-16 and HPV-18 in cervical carcinomas from women in Latin America and the Caribbean.

Additionally, some HPV variants are more often associated with invasive neoplasia. The likelihood of having cervical cancer associated with an Asian-American (AA) HPV variant was higher when compared with the European variant. Almost 25 percent of cervical cancers in Mexico were attributable



to AA HPV-16 variants. In Guanacaste, Costa Rica, women infected with non-European variants of HPV-16 were 11 times more likely to be diagnosed with cervical cancer compared with those infected with the HPV-16 prototype.

**Table 7**  
HPV Prevalence in Cancer Specimens  
In Selected Latin American Countries

Country	No. of Invasive Carcinomas Screened for HPV	Any HPV [%]	HPV -16 [%]	HPV -18 [%]
Argentina	57	94.7	59.6	14.0
Bolivia	49	91.8	34.7	4.1
Brazil	46	87.0	52.2	8.7
Chile	80	92.5	45.0	5.0
Colombia	38	94.7	52.6	7.9
Cuba	45	93.3	57.8	6.7
Panama	73	93.3	46.6	15.1
Paraguay	117	94.0	54.7	11.1

Source: F. Xavier Bosch, 1995

**Table 8**  
HPV Prevalence in Some Caribbean Countries

Country	Specimen Type	No. of Specimens Screened for HPV	Any HPV [%]	HPV- 16 [%]	HPV- 18 [%]
Barbados	Genital Carcinomas	20	90.0	65.0	0.0
Jamaica	CIN3 & Invasive Carcinomas	39	92.0	36.0	8.0
Trinidad & Tobago	Exfoliated Cervical Cells	328	6.7	3.6	0.6
Suriname	Cervical Carcinomas	130	82.0	49.0	19.0

Sources: Prussia et al, 1993; Rattray et al, 1996; Lewis, 1988; Krul et al, 1999

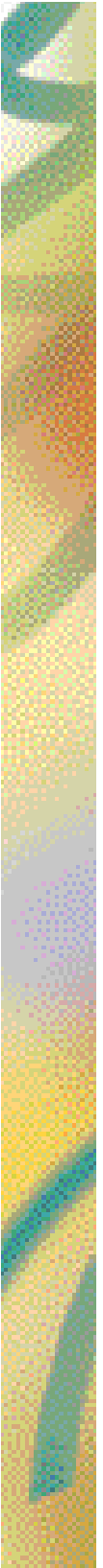
## Cofactors in HPV Carcinogenesis

Environmental agents such as cigarette smoke, hormonal contraceptives, diet and other infectious organisms have been evaluated as possible cofactors with HPV in cervical carcinogenesis. Well-controlled epidemiological studies have demonstrated that HPV-positive cervical cancer cases are twice as likely to have been smokers when compared with HPV-positive controls. Additionally, recent studies among HPV-positive women have indicated that the risk of cervical cancer is higher among women who have used oral contraceptives for more than 10 years.

## Other HPV-related Issues

Cervical cancer represents one of the very few common cancers for which a specific etiological agent has been identified. The ability to screen and diagnose women for infection with high-risk HPV types would be invaluable, as it would facilitate closer monitoring of persistently infected women, even those with normal cervical cytology.

Consequently, much effort is being directed to the commercial development of rapid, inexpensive HPV screening assays with excellent test performance measures. Additionally, other research is underway to identify biomarkers that may better predict which patients are at risk for the development of high-grade squamous intraepithelial lesions. Significant work is also being undertaken regarding the immunology of HPV infection and host-viral interactions, especially with a view to vaccine development and the production of immunotherapeutic products.



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## HPV Vaccine Developments

Current progress in HPV vaccine development was presented at the 20th International Human Papillomavirus Conference in October 2002. Two recent studies demonstrated that HPV-16 vaccines prevented *de novo* infection, produced prophylactic neutralizing IgG antibodies and conferred type-specific protection, and were well tolerated and highly immunogenic.

Therapeutic vaccines are being studied in animal models and have been shown to elicit tumor regression. The field results of one therapeutic vaccine trial reduced the HPV-16 DNA viral load and elicited humoral and cell-mediated immune responses. However, it did not effect any change in histology or colposcopic findings at seven weeks post vaccination.

## HPV Testing and the Bethesda Classification System

The ability to identify HPV DNA in cervical specimens has resulted in a renewed discussion of the current Bethesda System for classification of cervical cytopathology. When a woman tests positive for a high-risk HPV type, the manner in which a cytopathologic diagnosis is reported can carry different implications for clinical management. Interpretative and probability models have been proposed.

Under the interpretative model, the presence of a high-risk HPV type together with atypical squamous cells of undetermined significance (ASCUS) would be interpreted as a low-grade squamous intraepithelial lesion (LSIL). Under the probability model, the same result would elicit the explanation that such findings may suggest a 10-20 percent risk of an underlying high-grade squamous intraepithelial lesion (HSIL) or a more severe lesion.



# prevention and control programs

An effective cervical cancer prevention and control program must address a number of issues, including the coverage and quality of the early detection screening services and the availability of prompt, reliable and affordable diagnosis, treatment and follow-up care. Other supportive infrastructural elements, such as counseling services and information systems, also are required to enhance the quality of care and facilitate effective patient and program management.

Program effectiveness can be greatly influenced by the religious, socio-cultural and gender perspectives of women. Barriers to client participation include such predisposing factors as awareness and knowledge, health beliefs, values, attitudes and fears; enabling factors such as costs, ease of access and acceptability of services; and reinforcing factors such as societal expectations.

## Barriers to Effective Participation

Studies have revealed that women were hesitant to access screening because they perceived cervical cancer to be synonymous with death. A lack of information about possible treatments created additional fear among women, and this was further compounded by the impersonal manner in which health care workers communicated with affected women. Additionally, male health care providers were viewed as a deterrent to accessing screening by some women.

In Mexico, knowledge of the benefits of screening, socioeconomic status and schooling were the principal predictors of utilization of screening services. Specifically, university-educated women were four times more likely to have visited the Programa de Detección Oportuna de Cáncer (DOC), while women who were insured were twice as likely to have attended. Women who resided in good housing had a Pap smear coverage rate four times greater than those who lived in poor physical conditions.

One study in a rural area of Mexico revealed that only 40 percent of women of reproductive age knew what a Pap test was, while in Grenada, West Indies, 17.9 percent of the women interviewed did not know the purpose of a Pap test.

One of the principal barriers to accessing public health facilities for a Pap test relates to very long waiting times for results. As reported from Bolivia, when results were delayed, women invariably lost interest in the program and often did not return. In addition, the physical conditions under which a Pap smear was taken (usually cramped and lacking privacy) did not contribute to a positive experience, especially when there was the perception that the amenities in the private sector were significantly more spacious and private.

In other instances, diagnosis and treatment were not automatically scheduled, resulting in lack of appropriate and timely follow-up of affected women. In Peru, even when additional modalities for treatment were scheduled, factors related to geographic access and costs constituted severe barriers.

In Jamaica, a recent study revealed that in addition to poverty, having cancer was an independent risk factor for medical indigence. Cancer patients incurred average annual expenses of J \$66,506.20 [U.S.A. equivalent \$1,100]. The largest proportion (67 percent) of medically indigent and at-risk persons (those who reported that their illness was causing them financial difficulties) was among cancer patients. A larger proportion of females were medically indigent or at risk for indigence. While not a specific focus of this study, very high cervical cancer incidence and mortality rates have been documented among women in Jamaica since the 1950s.

## Cytological Screening Quality Issues

The quality and coverage of cervical cytological screening constitutes a major deficiency in cervical cancer prevention programs in Latin America and the Caribbean. Issues related to the quality of smear sampling, collection, preparation and interpretation have been identified in numerous program reviews.

In Venezuela, a review of the diagnoses of 341 women in the Cervical Cancer Control Program in Aragua State between 1995-1996 determined that 22 percent (75/341) had been diagnosed as having cervical intraepithelial neoplasia (CIN) grade 3 on cytology, while 31 percent (105/341) were confirmed with this lesion on histology.

In a 1996 Mexican study on the quality of cytological specimens, it was noted that 64 percent of a random sample of Pap smears lacked endocervical cells, mucus and epidermoid metaplasia, the presence of which are indicative of sampling from the transformation zone. False negative rates ranged from 10 to 54 percent among the 16 reading centers reviewed. Of 1,039 Pap smears classified as negative by cytotechnicians, 37 were identified as invasive by an expert.

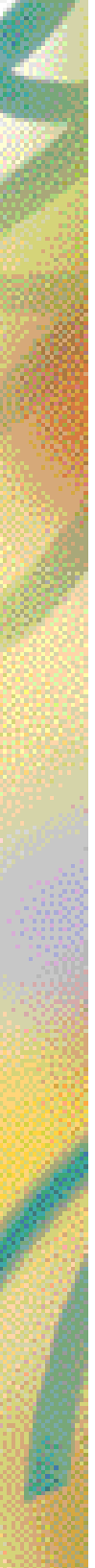
In a 1988 study of risk factors for cervical intraepithelial neoplasia among women in Trinidad, Pap smears were read at both Port of Spain General Hospital in Trinidad and the Johns Hopkins University Hospital in Baltimore, Maryland, U.S.A. Inter-reader agreement was calculated at 44 percent and 2.5 percent for urban and rural women, respectively.

In recognition of these problems, PAHO developed an external quality control system to improve the effectiveness of cytology laboratories in selected countries of Latin America. This Pan American Cytology Network (RedPAC) currently consists of 45 laboratories in seven Latin American countries [Chile,

Mexico, Peru, Costa Rica, Ecuador, Venezuela and Bolivia] with a Reference Center in Santiago, Chile.

Through the RedPAC system, significant efforts have been made to improve the technical and administrative quality of cytology laboratories. These efforts include assessments of laboratory operations, establishment of a proficiency testing program that evaluates a technician's cytological interpretation compared to an expert panel, provision of continuing education to strengthen technical skills and laboratory management, and provision of technical assistance for internal quality assurance methods.

A recent review of RedPAC's performance revealed that while there were demonstrable improvements in some laboratories regarding their diagnostic concordance with the external expert panel over three rounds of proficiency testing, this was not the case in others.



**Table 9**

Results of Cervical Cytology Proficiency Testing  
Laboratories of the Pan American Cytology Network [RedPAC]  
1998-2000

Country	Laboratories & [Observers]	Year	Observed Concordance [%]	Under Diagnosis [%]	Over Diagnosis [%]	Kappa Index	Change in Kappa Index [%]
Mexico	15 [84]	1998	74	18	8	.57	
	[83]	1999	79	17	4	.65	+14
	[***]	2000					
Costa Rica	1 [5]	1998	76	10	13	.61	
	[21]	1999	48	50	2	.32	
	[32]	2000	83	2	15	.65	+7
Ecuador	6 [36]	1998	65	31	4	.47	
	[40]	1999	71	20	9	.51	
	[52]	2000	84	14	2	.73	+55
Venezuela	5 [41]	1999	77	17	6	.61	
	[41]	2000	75	23	2	.61	0
Chile	10 [48]	1999	79	21	1	.66	
	[44]	2000	93	6	1	.87	+32
Peru	6 [31]	1999	69	23	7	.50	
	[29]	2000	70	27	3	.53	+6
Bolivia	2 [8]	2000	81	6	12	.64	

Source: Dr. Rodrigo Prado B, 2001  
[\*\*\*] No data currently is available from Mexico.

## Coverage Issues

Many countries have identified a target population of women eligible for cervical cancer screening within their national norms and guidelines. However, persistently low coverage still appears to be a ubiquitous problem in most countries.

**Table 10**

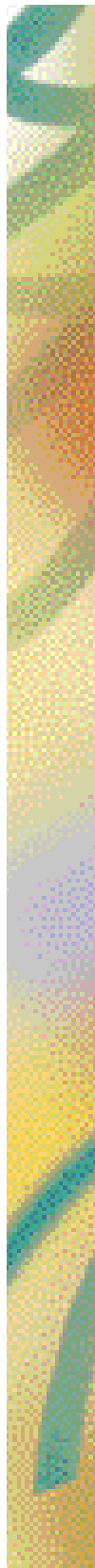
Proportion of Women Having A Pap Smear Within the last 12 Months in Selected Countries of Latin America and the Caribbean

Country	Year	Target Population	Percentage
Costa Rica	1986	2,451	70.5
Costa Rica	1993	2,656	66.9
Ecuador	1987	3,657	27.8
Ecuador	1994	4,969	72.2
El Salvador	1993	3,495	79.2
Guatemala	1987	1,114	76.0
Honduras	1996	3,120	55.4
Jamaica	1997	6,382	15.3
Nicaragua	1992	2,997	61.1
Nicaragua	1998	13,633	20.5
Paraguay	1996	3,171	49.1
Peru	1996	21,418	42.9
Dominican Republic	1996	4,996	44.8
Trinidad & Tobago	1987	903	35.4

SOURCE: PAN AMERICAN HEALTH ORGANIZATION, 1999

Further, when age-specific coverage is analyzed, it becomes evident that younger women are being screened disproportionately and with greater frequency. In most countries in Latin America, cervical cancer screening initiatives are linked to Family Planning and Prenatal Care Programs. Between 1991-1994, 93 percent of the 84,016 women screened in Aragua State, Venezuela, were screened in Family Planning and Prenatal Care Services. As a consequence, the women who were screened were young, usually in their 20s, and at a much lower risk of invasive cervical cancer than older women. In the Venezuelan Cervical Cancer Control Program, the majority of screened women were aged 25-35 or younger, even though the target population was defined as women aged 25-64. Hence, low coverage was achieved overall, as only about 35 percent of the target population was screened.

Based on the discussion at a sub-regional workshop in Cuba in October 2001, only Cuba and Puerto Rico reported coverage rates of 60-80 percent. All other participating countries indicated that their coverage was less than 60 percent.







# challenges to prevention & control

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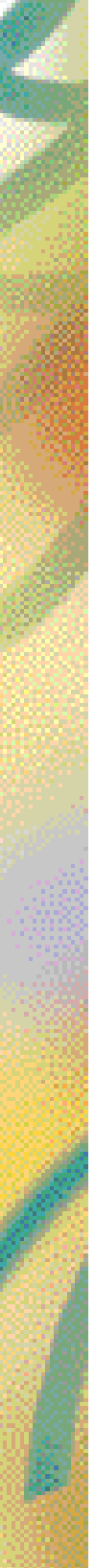
## National Capacity Assessment Survey — 2001

In 2001, the World Health Organization (WHO) conducted a survey to assess national capacities for chronic disease prevention and control. As some questions were specific to cervical cancer, it was possible to gain a limited understanding of current national capacities relating to this disease. The following information was synthesized directly from questionnaires provided to PAHO from 35 country-respondents in the Americas, including the U.S.A.

Only 19 respondents from the Americas (54.2 percent) reported having a cancer control plan that focused on cervical cancer. About 46 percent (16/35) of participating countries indicated that surveillance or information systems for cervical cancer had been established in their countries. Some 24 respondents (68.5 percent) indicated that cervical cancer prevention or management guidelines were available, and about 77 percent (27/35) reported that equipment and facilities existed at the primary health care level for monitoring cervical cancer.

The existence of few surveillance or information systems for cervical cancer represents a significant weakness, as it precludes reliable program monitoring and impact evaluation.

Similarly, the absence of national plans for cervical cancer severely constrains efforts at advocacy, marketing and resource mobilization. Even when national plans existed, they often were not evidence-based or appropriate to the local capacity and resources, with special reference to primary care.



**Table 11**

Country Responses to Specific Questions on Cervical Cancer  
 Compiled from Questionnaires from LAC Countries

Country	Focused Cervical Cancer Plan	Surveillance or Information System Functional	Prevention or Management Guidelines Available	Equipment & Facilities Available at PHC Level
Anguilla				
Argentina	•	•	•	
Aruba				•
Bahamas			•	
Belize				•
Bolivia	•		•	•
Brazil	•	•	•	•
Chile	•	•	•	•
Costa Rica	•		•	•
Cuba	•	•	•	•
Dominica		•	•	•
Ecuador	•		•	•
El Salvador		•		•
Grenada		•		•
Guatemala	•		•	
Guyana				
Haiti				
Honduras			•	•
Jamaica	•	•	•	•
Mexico	•	•	•	•
Montserrat		•	•	•
Netherlands Antilles				•
Nicaragua	•		•	•
Panama	•	•	•	•
Paraguay			•	•
Peru	•	•	•	•
Republica Dominicana			•	•
St.Kitts & Nevis				•
St. Lucia	•	•		
St. Vincent & the Grenadines	•	•	•	•
Suriname	•		•	•
Trinidad & Tobago	•		•	•
United States	•	•	•	•
Uruguay				
Venezuela	•	•	•	•



# sub-regional consultations — 2001

Between June and October 2001, four workshops on cervical cancer prevention were convened in the English-speaking Caribbean, the Central American, Southern Cone and Andean sub-regions of the Americas. These workshops were intended to:

- Build alliances among stakeholders and develop a forum for technical cooperation and advocacy;
- Facilitate the identification of current problems and potential solutions, based on the realities and needs of existing networks of stakeholders;
- Advocate for resources and facilitate the creation of technical advisory groups to assist countries with program planning; and
- Aid lobbying efforts and the recommitment of governments to allocate resources for cervical cancer prevention.

In all sub-regions, many activities and programs related to cervical cancer prevention and control were already in existence. While some issues associated with cervical cancer programming were common across all sub-regions, other issues were unique or presented greater challenges for some countries. For example, the small size of many Caribbean countries affected their ability to recruit and retain specialized human resources and maintain proficiency in cytology. Similarly, ensuring a quality cervical cancer prevention service, including diagnosis and treatment, in the Altiplano Region of Bolivia presented significant challenges, due to the high elevation of this area and the consequent difficult access.

## Common Issues and Challenges

### UNDER-RECOGNITION OF CERVICAL CANCER AS PREVENTABLE HEALTH PROBLEM

A profound challenge to effective cervical cancer prevention in Latin America and the Caribbean appears to be an absence of genuine support within the political structures of many countries. This situation may be due partly to a lack of knowledge about cervical cancer and its preventability or alternatively to the perception that this disease neither results in immediate death nor produces acute epidemics requiring expeditious containment action.

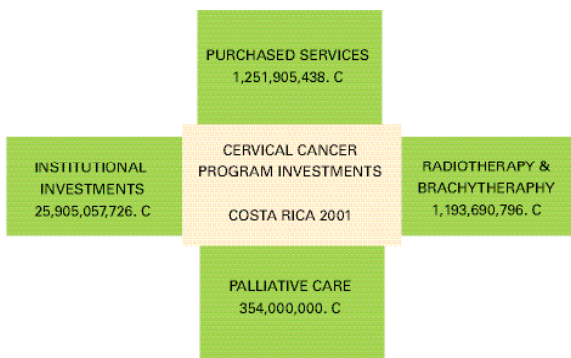
Consolidated political support from within the ranks of the professional elite is also crucial for program effectiveness. For example, Venezuela indicated there was frequent disagreement among the oncologists, gynecologists and pathologists regarding national policies and program procedures, in spite of efforts to achieve consensus on treatment issues. Such situations could potentially undermine the efforts of national health authorities.

### INADEQUATE FINANCIAL RESOURCES

In all of the sub-regional discussions, inadequate financial resources were listed as a limiting factor to program effectiveness, and it was recognized that significant investments in secondary prevention are necessary not only for screening, but also for the provision of essential diagnostic, curative and palliative services.

While current funding for cervical cancer programs may be inadequate, careful evaluation of program efficiencies and effectiveness is an important and early requirement of any needs assessment exercise. This ensures that any request for additional resources is based on a rational analysis.

Figure 3



[1 U.S. DOLLAR = 432 COLONES]

Source: Medina, D: Analisis de la Situacion del Cancer de Cervix en Costa Rica. Paper presented at a Sub-regional Workshop on Cancer of the Uterine Cervix, Cuba, October 1-2, 2001

### INADEQUATE HUMAN RESOURCES

Lack of human resources, both in quantity and quality, was repeatedly cited as a major program constraint by all countries. However, when compared with all other required professionals, the supply of cytopathologists and cytotechnologists was the most deficient. In some countries, even where the overall numbers of personnel were adequate, there were distributional deficiencies, which resulted in rural areas being under-served.

In El Salvador, for example, lack of human resources at peripheral cytology laboratories impacted negatively on internal quality control. Additionally, even when staff was available, low organizational capacity, technology and infrastructure hampered the effective discharge of functions.

### SUB-OPTIMAL PROGRAM ORGANIZATION AND MANAGEMENT

In many countries, although cervical cancer screening was being performed, the various parts of a cancer control program were not fully integrated or well coordinated either within or between the public or private health sectors so as to create an efficient and effective program. This was true in Guatemala, Honduras and the Dominican Republic.

In some countries, there was little coordination between the many agencies that provided screening in the private and non-governmental sectors and the treatment centers. Hence, women requiring further diagnosis and treatment had to navigate these services on their own. In El Salvador, patients diagnosed with dysplasia were required to follow a complex maze of procedures and mechanisms that appeared to be tedious and repetitive. In addition, they experienced excessive delay in obtaining accurate, certified results. These difficulties increased the potential for non-compliance with treatment recommendations, so that screened-positive women may be lost to follow-up. Further, only 60 percent of women screened in El Salvador had access to treatment.



## ABSENCE OF NATIONAL POLICIES AND PLANS

An absence of norms and procedural guidelines for cervical cancer prevention and control made it difficult to institutionalize the program and achieve standardization. For example, few countries in the English-speaking Caribbean have written cervical cancer program and procedural guidelines. The absence of uniform standards was frequently observed in the area of cytology, as in many countries a variety of cytological classifications were in use. Even when there were defined standards, compliance was not always optimal, so many programs failed to attract the defined target population.

Substandard quality control was a significant constraining factor at a number of service delivery points, including the actual collection of the Pap smear, its handling and processing by the laboratory, and the subsequent treatment of the client. This was a very critical issue for Panama and the Dominican Republic across these service delivery areas, while Mexico and Honduras reported difficulties at the laboratory level.

The quality and standard of treatment varied in some countries because there were few or no written guidelines governing treatment. This was reported by Guatemala and Panama. In 2003, El Salvador embarked upon a process to introduce and implement national treatment guidelines.

## WEAK INFORMATION SYSTEMS

Many countries do not have adequate information systems for the effective management of cervical cancer prevention programs. The absence of such systems precludes effective patient follow-up and management, ongoing assessment of coverage, and determination of a program's effectiveness through ongoing evaluation.

Even when information systems did exist, they were not always adequate. For example, in Argentina, information systems were not effectively linked across primary, secondary and tertiary levels, greatly hampering the referral processes for treatment and follow-up. In Bolivia, existing information systems functioned as unlinked and independent units, thereby increasing the potential for women to be lost to follow-up.

Further, it was difficult to collect consistent disease data. In some countries, such as Costa Rica and Cuba, population-based tumor registries of national scope were in existence, while in others there were regional or hospital-based registries. However, in many instances even where these registries existed, there were no attempts at information exchange or verification, so that there was real potential for duplication. In other countries, such as Bolivia, health personnel were not trained in the management of health information systems and there was no infrastructure to guarantee quality information.

### INADEQUATE TRAINING AND CAPACITY BUILDING

Ongoing training and skills building are necessary to maintain a cadre of proficient professional and support staff required for effective program delivery. The critical need for training and re-training of cytotechnologists — in their specific discipline of cytology and in the principles and application of laboratory quality control — was emphasized repeatedly in all sub-regions.

In Bolivia, few institutions offered training for cytotechnologists, so there were insufficient numbers of graduates to satisfy the current demand. A similar situation also exists in the English-speaking Caribbean.

### INADEQUATE COMMUNICATION WITH CLIENTS AND COMMUNITY

Some countries required training assistance related to the methods for organizing and mobilizing community participation to support effective cervical cancer prevention and control. Further, information and educational materials about cervical cancer were very weak and public education lacked impact.

### INSUFFICIENT EQUIPMENT

While some countries had insufficient biomedical equipment, others, such as Venezuela, indicated that old and obsolete biomedical equipment was a significant problem, especially in the area of radiotherapy.

## Suggested Solutions

### FORMATION OF TECHNICAL ADVISORY GROUPS

In all of the sub-regional meetings, participating countries strongly recommended the formation of Technical Advisory Groups [TAGs] at national and sub-regional levels, with a mandate to provide guidance for the development of strategic policies and plans. These groups should consist of gynecologists, cytopathologists, representatives of relevant non-governmental organizations, and persons skilled in social communications and marketing.

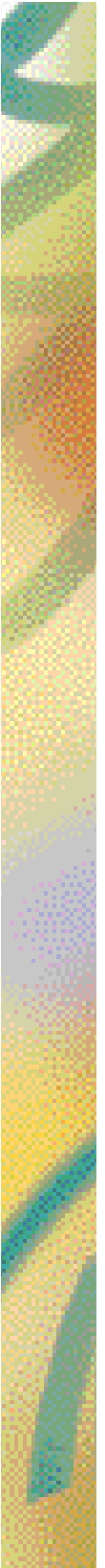
### ADVOCACY AND COMMUNICATION

Advocacy to ensure the inclusion of cervical cancer prevention on the political agenda of each member country was cited as a critical factor, as it had been well recognized that it was this agenda that would dictate the technical programs for priority implementation. Further, this political support would translate into future resources for program execution. To garner support and resources, it is essential to liaise with and include relevant political and economic alliances, such as MERCOSUR (Brazil and the Southern Cone countries), Hipolito Unanue (Chile and the Andean countries), RESSCAD (Central America, Panama and the Dominican Republic) and CARICOM (the Caribbean Community), as well as non-governmental organizations in discussions about cervical cancer prevention.

Improved communication with the community, mass media, private sector, women's organizations and other groups was viewed as imperative for program success. However, a systematic, linguistically appropriate and consistent approach is required, using technically accurate and culturally sensitive information, tailored for the specific audience and environment.

Regional and national analyses of the epidemiologic, socio-demographic and programmatic cervical cancer situations were identified as essential for effective advocacy at the political, technical, donor and community levels.

### PROGRAM DEVELOPMENT



Clearly articulated strategic, national policies should shape the formulation of any effective cervical cancer prevention program. Plans of Action establishing short-, medium- and long-term goals and objectives should be developed and include realistic program costs and mobilization mechanisms for financial and human resources.

There was clear consensus in all sub-regional meetings of the need for central coordination of cervical cancer prevention, management and control programs. Central coordination would ensure that the public and private sectors, Social Security Agencies and Non-Governmental Organizations worked collaboratively to increase screening coverage and access of the at-risk population to diagnosis and treatment services.

It was agreed that well-defined norms and guidelines for patient management and program monitoring and evaluation were essential. Further, compliance with such guidelines was viewed as the foundation of the program.

It was suggested that norms and standards should be established to include these components:

- Screening and Detection of pre-cancerous cervical lesions
- Screening Test
- Collection and Handling
- Administration
- Registration and Follow-up
- Diagnosis
- Treatment
- Rehabilitation
- Pain Alleviation and Palliative Care

The development of functional information and surveillance systems was strongly recommended as a substantive pillar for effective programming, in order to measure the impact of the proposed interventions.

#### RESEARCH NEEDS

Some countries reported that there was a need for

research studies that would better clarify the type-specific prevalence of Human Papillomaviruses in their populations. Others expressed an interest in research to evaluate the costs and cost-effectiveness of new screening, diagnostic and treatment modalities.

#### POSSIBLE AREAS FOR COLLABORATION

A number of suggestions were offered as possible mechanisms for enhanced inter-country and inter-regional collaboration. These suggestions included:

Convening regular conferences to serve as an effective vehicle for idea and information exchange. The Internet was suggested as a very powerful avenue for information sharing.

Establishing a bank of health information and social communication related to cervical cancer prevention.

Adopting and applying standardized methodologies for quality assurance of screening tests.

Utilizing common research protocols for multi-country studies; for example, for assessing HPV prevalence.

Adopting and applying consensus protocols for the treatment of precursor lesions as well as invasive cervical cancer.

Making greater use of the mechanisms of Technical Cooperation between Countries [TCC], so that countries with more efficient and effective programs or with a specific expertise (for example, information systems development) would provide technical assistance to others with those areas of need.

Making greater use of recognized regional centers of excellence as possible training sites; for example, the



population-based cancer registry in Colombia or the Tamizaje y Tratamiento Inmediato (TATI) Program in Peru for the application of Visual Inspection with Acetic Acid and immediate treatment.

Creating a database or network of respected professionals and researchers in cervical cancer in the region, which would facilitate greater intra-regional collaboration and information exchange.

### TRAINING

It was recommended that information about cervical cancer, including its natural history, its epidemiology, how it may be prevented and the latest public health recommendations about screening, diagnosis and treatment, should be incorporated into the curricula of medical, nursing, laboratory sciences and other professional schools.

## Unfinished Agenda Items

### SCREENING POLICIES

There is a need to articulate a consensus position regarding the target age group for screening as well as the screening frequency.

Additionally, the results of a number of international operational research studies being conducted by partners in the Alliance for Cervical Cancer Prevention (ACCP) will help determine what may be the best screening tests in terms of performance, cost-effectiveness and ease of use, individually or in combination, specifically for use in low-resource settings that are prevalent in Latin America and the Caribbean.

**Table 12**

### Target Population and Screening Periodicity Selected Countries of Latin America and the Caribbean

Country	Target Population [years]	Screening Frequency
Dominican Republic	25-59	Every Year
Guatemala	30-45	Every Year
Costa Rica	25-59	Every Two Years
El Salvador	30-59	Every Two Years
Argentina	35-64	Every Three Years
Bolivia	25-49	Every Three Years
Chile	25-64	Every Three Years
Cuba	25-59	Every Three Years
Panama	15 & over	Every Three Years
Venezuela	25-64	Every Three Years

Source: Compiled from country documents available to PAHO

### POSITIONING OF CERVICAL CANCER PREVENTION PROGRAMS

This is an opportune time for countries to rethink their disease prevention and control priorities and to include cervical cancer as a public health priority. While traditionally it appears that cervical cancer screening activities were organized as an integral part of reproductive health services, there are many possibilities regarding its placement. Throughout the sub-region, cervical cancer prevention programs have been part of a wider program of integrated women's health, or have been included with prevention and control of breast cancer. It has been suggested that cervical cancer be included with preventive services for chronic diseases such as diabetes, obesity and hypertension, which are also significant causes of disease in women. It has also been suggested that cervical cancer should fall under the purview of sexually transmitted disease programs.

It is evident that cervical cancer persists as a significant public health problem in Latin America and the Caribbean. Every year, about 77,000 new cases are diagnosed, and some 30,000 women die prematurely from this disease.



# conclusion

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Effective secondary prevention through screening and early detection is available and has proven effective when coupled with appropriate and adequate treatment. However, significant management and organization as well as appropriate financial and human resources are required to assure and sustain program quality and effectiveness. The inability to sustain essential infrastructure, organization and quality across all of the service delivery points along the cancer care continuum is the most significant challenge faced by the developing countries of Latin America and the Caribbean.

This review indicates that most, if not all, of the countries have elements of a cervical cancer prevention program in place. However, fragmentation and a lack of coordination have severely hampered integration of these constituent elements into effective, cohesive programs. For optimal effectiveness, screening programs must be better integrated with treatment and follow-up programs.

Further, in order to ensure that women throughout the region have access to cervical cancer screening and treatment, it is imperative to advocate for political commitment and financial support. Educational and outreach programs that heighten awareness about cervical cancer as a preventable disease must be directed to women and the community-at-large.

Finally, ongoing assessment, whether as surveillance or research, is necessary to provide the scientific basis and public health evidence for policy formulation and program development.

The cumulative result of such efforts will be the establishment and utilization of cost-effective prevention programs that are designed to be responsive to the needs of women throughout the region. The end product may be fewer deaths from cervical cancer throughout the Region of the Americas.

## Limitations

One major limitation encountered during the preparation of this report relates to the age of much of the relevant data and information, especially at the country level. When no more recent information could be obtained, a decision was made to include older data or information to illustrate salient discussion points. The acquisition of recent mortality data was especially challenging, because many countries still experience ongoing difficulties in providing validated, up-to-date mortality statistics.



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