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Prognostic Performance of the 2018 International Federation of Gynecology and Obstetrics Cervical Cancer Staging Guidelines

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Abstract

OBJECTIVE: To examine the prognostic performance of the revised 2018 International Federation of Gynecology and Obstetrics (FIGO) cervical cancer staging schema.

METHODS: We used the National Cancer Database to identify women with cervical cancer diagnosed from 2004 to 2015. Using clinical and pathologic data, each patient's stage was classified using three staging schemas: American Joint Committee on Cancer 7th edition, FIGO 2009 and FIGO 2018. The FIGO 2018 revised staging classifies stage IB tumors into three substages based on tumor size (IB1–IB3) and classifies patients with positive lymph nodes (pathologically or clinically detected) as stage IIIC1 (positive pelvic nodes) or IIIC2 (positive para-aortic nodes). Five-year survival rates were estimated for each stage grouping. We sought to determine whether the 2018 FIGO staging system was able to offer improved 5-year survival rate differentiation compared with older staging schemas.

RESULTS: A total of 62,212 women were identified. The classification of stage IB tumors into three substages improved discriminatory ability. Five-year survival in the FIGO 2018 schema was 91.6% (95% CI 90.4–92.6%) for stage IB1 tumors, 83.3% (95%S CI 81.8–84.8%) for stage IB2 neoplasms, and 76.1% (95% CI 74.3–77.8%) for IB3 lesions. In contrast, for women with stage III tumors, higher FIGO staging was not consistently associated with worse 5-year survival rates: stage IIIA (40.7%, 95 CI 37.1–44.3%), stage IIIB (41.4%; 95% CI 39.9–42.9%), stage IIIC1 (positive pelvic nodes) was 60.8% (95% CI 58.7–62.8%) and stage IIIC2 37.5% (95% CI 33.3–41.7%).

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CONCLUSION: The FIGO 2018 staging schema provides improved discriminatory ability for women with stage IB tumors; however, classification of all women with positive lymph nodes into a single stage results in a very heterogeneous group of patients with highly variable survival rates.

Unlike most solid tumors, cervical cancer has historically been staged clinically. The International Federation of Gynecology and Obstetrics (FIGO) staging guidelines for cervical cancer allow assessment of the extent of disease based on clinical examination and basic imaging modalities such as chest X-ray.[1,2] Although advanced imaging modalities, such as positron emission tomography and magnetic resonance imaging, are often used to plan treatment, the results of these studies do not inform staging.[1] Because cervical cancer most commonly occurs in resource-limited regions, clinical staging allows for the comparison of outcomes across countries.

Over the past two decades the staging guidelines for cervical cancer have gradually shifted.[1,2] In 2009, the staging guidelines for cervical cancer were updated with minor modifications that included the introduction of a new substage for women with early vaginal involvement.[1,2] In 2018, FIGO released revised staging guidelines that for the first time allowed the use of imaging modalities, as well as pathologic assessment for staging.[3] This staging schema recognizes nodal metastases, identified either pathologically or radiologically, as a separate stage, stage IIIC. Patients with positive pelvic lymph nodes are classified as stage IIIC1, those with positive para-aortic nodes as stage IIIC2.[3] The new staging criteria also further subdivides women with early-stage cervical cancer based on tumor size.[3] To date, there have been too few data to describe the prognostic performance of this new staging system.

The primary objective of our study was to examine the prognostic performance of the 2018 FIGO cervical cancer staging schema. Specifically, we sought to determine whether the 2018 FIGO staging system was able to offer improved 5-year survival rate differentiation compared with the 2009 FIGO staging system and the tumor, node, metastasis classification system.

METHODS

The National Cancer Database was used for analysis. The National Cancer Database is a hospital-based registry developed by the American College of Surgeons and the American Cancer Society that collects data on patients who receive their cancer diagnosis or treatment at more than 1,500 Commission on Cancer–affiliated hospitals across the United States.[4-6] The National Cancer Database currently captures approximately 70% of all incident cancer cases.[5] Data elements include patient sociodemographics, tumor characteristics, first course of treatment before disease progression or recurrence, follow-up, and survival.[5,6] Regular audits are performed to guarantee data integrity and completeness reported to the National Cancer Database. The study analyzed de-identified data and was deemed exempt by the Columbia University Institutional Review Board.

We identified women diagnosed with invasive cervical cancer from 2004 to 2015 who had cervical cancer as their first cancer diagnosis and that was confirmed histologically. Women with incomplete information on clinically determined size or extension of the primary tumor,

regional nodes metastasis, and distant metastasis stage defined by the American Joint Committee on Cancer criteria were excluded from the analysis. The survival cohort was further restricted to women who had follow-up and vital status data available.

Patients were staged using three staging schemas: American Joint Committee on Cancer 7th edition, FIGO 2009 staging and FIGO 2018 staging (Table 1). We first classified the cancer stage based on American Joint Committee on Cancer's Cancer Staging Manual 6th and 7th editions. Cancer stage for patients diagnosed from January 2004 through December 31, 2009 (American Joint Committee on Cancer 6th edition) were converted to American Joint Committee on Cancer 7th edition.[7] Data on tumor size were used to reclassify stage IB patients into IB1 (clinically visible lesion no more than 4 cm in greatest dimension) and IB2 (greater than 4 cm), and stage IIA patients into IIA1 (clinically visible lesion no more than 4 cm in greatest dimension) and IIA2 (greater than 4 cm) given size information available. The American Joint Committee on Cancer 7th edition criteria are similar to FIGO 2009 criteria except that patients with positive nodes and any tumor stage from I-IIIB are classified as stage IIIB.[7]

The FIGO 2009 criteria were used to generate the FIGO 2009 cancer stage cohort. Available staging data, as well as characteristics on tumor size and nodal disease, were used to stage patients based on the 2018 FIGO guidelines. The FIGO 2018 guidelines further classify patients with stage IB tumors into three substages based on tumor size: stage IB1 (tumor less than 2 cm), stage IB2 (tumor at least 2 cm but no bigger than 4 cm) and stage IB3 (tumor at least 4 cm).[3] The FIGO 2018 classification schema also classifies women with positive lymph nodes, determined either pathologically or clinically, as stage IIIC. Pathologically positive lymph nodes were verified by pathologic assessment. Lymph nodes that were suspicious by imaging, palpation or visualization, but not evaluated pathologically, were classified as clinically positive lymph nodes. Among women with stage IIIC tumors, patients with positive pelvic nodes are grouped as stage IIIC1 and women with positive para-aortic lymph nodes classified as IIIC2.[3] For each staging system, patients who could not be classified into given substages were grouped as not otherwise specified. An exploratory analysis in which patients with positive and negative nodes were identified and classified as stage I-IIIB tumors based on the other FIGO 2018 criteria is presented.

Patients' demographic data included age at diagnosis (younger than 40, 40–49, 50–59, 60–69, 70–79, 80 years or older), race and ethnicity (white, black, Hispanic, other, unknown), year of diagnosis, and insurance status (private, Medicaid, Medicare, uninsured, other governmental or unknown). Patients' socio-economic status was estimated by median household income and percentage of adults who did not graduate from high school in a patient's ZIP code area from Census tract survey data. Median household income was classified as less than $38,000, $38,000–$47,999, $48,000–$62,999, more than $63,000, or unknown; and the percentage of adults who did not graduate from high school was classified as at least 21%, 13–20%, 7.0–12.9%, less than 7%, or unknown. Patients' residential locations were estimated by matching state and county code to rural-urban continuum codes from the U.S. Department of Agriculture Economic Research Service, and were classified as metropolitan, urban, rural, and unknown. Comorbidity was measured using the Deyo classification of the Charlson comorbidity score, and grouped as 0, 1, or at least 2.[8]

Tumor characteristics also included histology (squamous cell, adenocarcinoma, adenosquamous, other or unknown), and grade (well, moderate, poorly, unknown). Patients' primary treatments were classified as primary surgery (with or without radiation), primary radiation (with or without surgery), chemotherapy only, no treatment, and unknown. Hospital characteristics included facility region (eastern, midwest, south, west, unknown) and facility type as defined by the American Cancer Society's Commission on Cancer Accreditation program criteria (academic centers, community centers or comprehensive community cancer centers, and integrated network cancer program).[4]

Patient demographics, tumor characteristics and hospital factors are presented descriptively. The primary objective was to estimate the performance of different staging schemes of American Joint Committee on Cancer 7th, FIGO 2009, and FIGO 2018 on survival rate. Specifically, we sought to determine the ability of the three staging schemas to provide 5-year survival rate differentiation. Overall survival was estimated from the date of diagnosis until death or last follow-up. Kaplan-Meier curves are presented. Five-year survival rates with 95% CIs are presented for each stage and substage. All analyses were conducted using SAS 9.4.

RESULTS

We identified a total of 62,212 women with invasive cervical cancer. The median age of the cohort was 50 years (interquartile range, 40–61). Overall, 61.3% of the women were white, 15.6% black and 12.8% Hispanic (Table 2). Medicaid recipients accounted for 22.8% of the population, 45.2% had private insurance, and 18.9% had Medicare. The most common histologic subtype was squamous cell carcinomas seen in 70.4% of women. Primary treatment consisted of radiation therapy in 51.1%; 39.4% underwent primary surgery.

A comparison of survival rates for the three staging schemas is displayed in Table 3. The classification of stage IB tumors into three substages improved discriminatory ability. In the 2018 FIGO staging, 4,480 women had stage IB1 tumors, 4,120 IB2 tumors, 3,790 stage IB3 neoplasms, and 1,522 that could not be further classified (stage IB NOS). The 5-year survival rate in the FIGO 2018 schema was 91.6% (95% CI 90.4–92.6%) for stage IB1 tumors, 83.3% (95% CI 81.8–84.8%) for stage IB2 neoplasms, and 76.1% (95% CI 74.3–77.8%) for IB3 lesions (Fig. 1, Appendix 1 [Appendix 1 is available online at http://links.lww.com/AOG/B420]). In contrast, the 5-year survival rate for the FIGO 2009 schema ranged from 85.5% (95% CI 84.5–86.3%) for IB1 tumors to 70.9% (95% CI 69.2–72.5%) for IB2 cancers. The corresponding 5-year survival rates were 86.6% (95% CI 85.4–87.7%) for IB1 and 74.4% (95% CI 72.1–76.5%) for IB2 tumors in the American Joint Committee on Cancer 7th edition staging.

In the 2018 FIGO staging system, 11,089 women had positive lymph nodes identified and were reclassified as stage IIIC (Table 3). Within the stage IIIC subgroups, 41.7% had positive pelvic nodes (IIIC1), 10.0% had positive para-aortic nodes (IIIC2), and 48.2% had positive nodes that could not be further classified (IIIC NOS). For women with stage III tumors, higher FIGO staging was not consistently associated with worse 5-year survival rates: stage IIIA (40.7%; 95% CI 37.1–44.3%), stage IIIB (41.4%; 95% CI 39.9–42.9%),

stage IIIC1 (positive pelvic nodes) (60.8%; 95% CI 58.7–62.8%), and stage IIIC2 (37.5%; 95% CI 33.3–41.7%) (Fig. 2, Appendix 2 [Appendix 2 is available online at http://links.lww.com/AOG/B420]).

When stratified based on whether the nodes were pathologically or clinically detected, a total of 3,439 patients had pathologically positive nodes (Table 4). Within this cohort, the 5-year survival rate was 52.2% (95% CI 49.1–55.3%) for those with stage IIIC NOS tumors, 70.9% (95% CI 67.8–73.7%) for IIIC1, and 45.1% (95% CI 38.3–51.7%) for IIIC2 tumors. Among the 7,650 with only clinically positive nodes, the 5-year survival rate was 44.5% (95% CI 42.7–46.2%) for IIIC NOS tumors, 53.3% (50.5–56.1%) for IIIC1 neoplasms, and 32.9% (27.6–38.3%) for IIIC2 neoplasms.

An exploratory analysis was performed in which patients were separated based on nodal status and retained within their respective stages (Table 5). For each respective stage, survival was better for node-negative patients compared with node-positive patients. For example, the 5-year survival rate was 83.3% (95% CI 81.8–84.8%) for node-negative stage IB2 tumors compared with 72.1% (95% CI 68.1–75.7%) for node-positive stage IB2 neoplasms. Similarly, when stratified by nodal status, there was generally a decrease in survival with increasing stage.

DISCUSSION

These data suggest that application of the FIGO 2018 staging schema will provide improved discriminatory ability for women with stage IB tumors. In contrast, classification of all women with positive lymph nodes into one stage will result in a very heterogeneous group of patients with highly variable survival rates.

Tumor size is an important prognostic factor for women with early-stage cervical cancer.[9-11] Increasing tumor size is associated with an increased risk of parametrial spread and nodal metastases and decreased survival rates.[10] The FIGO 2018 staging scheme, which divides women with stage IB tumors into three substages (smaller than 2 cm; at least 2 but no bigger than 4 cm; and 4 cm or larger), allows for improved prognostic discrimination. The size cut-points were chosen to help guide treatment. The International Federation of Gynecology and Obstetrics suggests that surgery is preferred for women with tumors smaller than 2 cm in diameter (stage IB1), whereas primary chemoradiation is the treatment modality of choice for those with tumors at least 4 cm in size (stage IB3).[3] FIGO suggests that either surgery or radiotherapy can be chosen for tumors that are at least 2 cm but are no bigger than 4 cm (stage IB2).[3] The recommendation for primary radiotherapy for larger stage IB tumors is based on the high likelihood that these patients will require adjuvant therapy if they undergo primary resection.[9,12-15] In our population there were similar numbers of patients within in each substage, and survival rates sequentially decreased with increasing substage.

We noted that inclusion of all women with positive lymph nodes into a single stage results in a highly heterogeneous group of patients. Although the presence of nodal metastases is highly prognostic for cervical cancer, survival is also strongly influenced by the extent of the local tumor.[16-22] For example, the survival rate of women with positive pelvic nodes (stage

IIIC1) was superior to that of women with stage IIIA and IIIB tumors, and was closer to the survival rate of women with stage II neoplasms. Even among women with positive para-aortic nodes (stage IIIC2), survival rates overlapped with those of women with stage IIIA-IIIB neoplasms. These data suggest that the presence of a bulky local tumor (stage IIIB) may be prognostically more significant than nodal metastases.[16-18,23] Further, these data strongly suggest that both the extent of the local tumor and nodal status should be combined to assign stage.

Given these findings, inclusion of all women with nodal disease in one stage category may not provide enough prognostic precision to be clinically meaningful. In an exploratory analysis, we found that subclassification of each stage based on the presence or absence of nodal metastases resulted in improved prognostic discrimination. Staging systems that combine local tumor characteristics and nodal status to assign stage are already widely used for other solid tumors.

In the current tumor, node, metastasis staging for non-small cell lung cancer, patients with positive nodes without distant metastatic disease are classified from stage IIB to IIIB, depending on the extent of the primary tumor and the extent of nodal disease.[24] Similarly, node-positive breast cancer without metastatic disease could be classified from stage IB to IIIC. For breast cancer, nodal staging is based on the size, number and location of involved lymph nodes.[25] Although combining tumor extent and nodal involvement would add complexity and require greater modification to the staging schema for cervical cancer, such a change may be necessary if nodal status is incorporated into the staging criteria for cervical cancer.

Although our study benefits from the inclusion of a large sample of women from across the United States, we acknowledge a number of important limitations. First, the analysis relies on the accuracy of staging data abstracted by tumor registrars. Prior work has demonstrated a high degree of accuracy for National Cancer Database data, and all three staging schemas would be susceptible to any misclassification of tumor staging data. Further, the accuracy of any staging schema relies on its application to large populations and abstraction of staging data from medical records. Second, some staging data were not captured across all years of study. For example, given that nodal disease was not a part of prior FIGO staging schemas, capture may have been inconsistent. Third, the National Cancer Database does not record cause of death. As such, our survival analysis is based on overall survival, and we are unable to capture cancer-specific survival. Fourth, we are unable to account for how variations in evaluation (imaging) influenced not only staging, but also treatment and survival. Lastly, unlike many tumor staging schemas, cervical cancer has historically been staged clinically. Although the results of advanced imaging influences treatment, such data are not used in the assignment of stage. This may limit the classification of some patients, but such a limitation would apply across all three of the staging schemas.

In summary, we found that that the revised FIGO 2018 staging schema for cervical cancer improves prognostication for women with early-stage disease but has significant limitations for the classification of those with nodal metastases. Given the heterogeneity of outcomes for women with nodal disease, a more nuanced staging schema incorporating both tumor

and nodal disease extent may be necessary. Further, given that the FIGO 2018 now allows both imaging and pathologic data to assign stage, further modifications to the staging system may be necessary as more data become available. Regardless of the revisions incorporated, any changes to the staging schema should be tested in a variety of settings worldwide.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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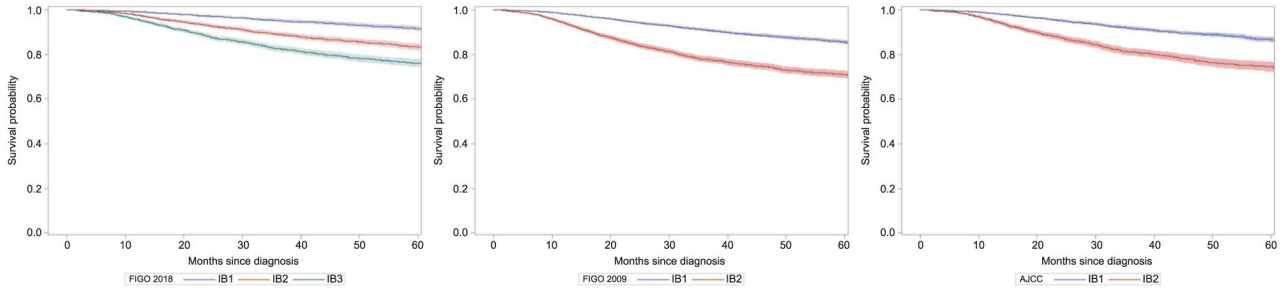

Fig. 1.

Kaplan-Meier curves for survival for stage IB cervical cancer. **A**. International Federation of Gynecology and Obstetrics (FIGO) 2018; (**B**) FIGO 2009; (**C**) American Joint Committee on Cancer (AJCC). *Shaded bands* represent the 95% confidence limits.

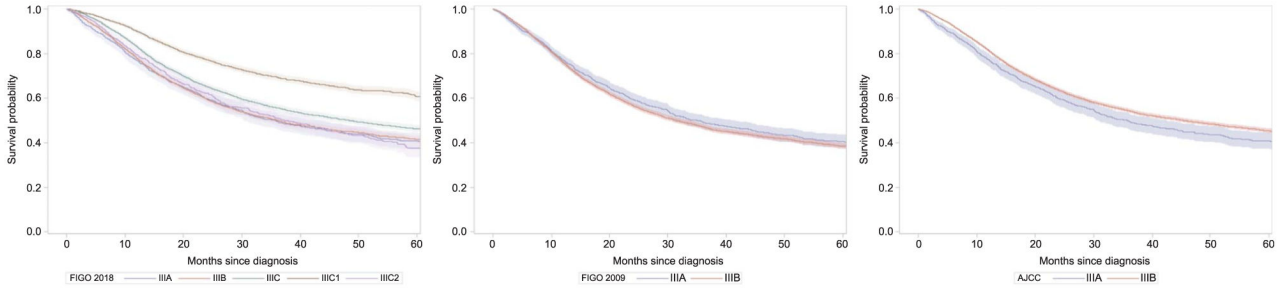

Fig. 2.

Kaplan-Meier curves for survival for stage III cervical cancer. **A**. International Federation of Gynecology and Obstetrics (FIGO) 2018; (**B**) FIGO 2009; (**C**) American Joint Committee on Cancer (AJCC). *Shaded bands* represent the 95% confidence limits.

Table 1.

Comparison of the Staging Schemas for Cervical Cancer

AJCC 7th		FIGO 2009		FIGO 2018	
Stage	**Description**	**Stage**	**Description**	**Stage**	**Description**
I	Cervical carcinoma confined to uterus	I	Cervical carcinoma confined to uterus	I	The carcinoma is strictly confined to the cervix
IA	Invasive carcinoma diagnosed only by microscopy. Stromal invasion with a maximum depth of 5.0 mm measured from the base of the epithelium and a horizontal spread of 7.0 mm or less. Vascular space involvement, venous or lymphatic, does not affect classification.	IA	Invasive carcinoma diagnosed only by microscopy. Stromal invasion with a maximum depth of 5 mm measured from the base of the epithelium and a horizontal spread of no more than 7 mm. Vascular space involvement, venous or lymphatic, does not affect classification.	IA	Invasive carcinoma that can be diagnosed only by microscopy, with maximum depth of invasion less than 5 mm
IA1	Measured stromal invasion no more than 3 mm in depth and no more than 7 mm in horizontal spread	IA1	Measured stromal invasion of no more than 3 mm in depth and no more than 7 mm in horizontal spread	IA1	Measured stromal invasion less than 3 mm in depth
IA2	Measured stromal invasion of more than 3 mm but no greater than 5 mm with a horizontal spread of no more than 7 mm	IA2	Measured stromal invasion of more than 3 mm but no greater than 5 mm with a horizontal spread of no more than 7 mm	IA2	Measured stromal invasion at least 3 mm and less than 5 mm in depth
IB	Clinically visible lesion confined to the cervix or microscopic lesion greater than T1a/IA2	IB	Clinically visible lesion confined to the cervix or microscopic lesion greater than T1a/IA2	IB	Invasive carcinoma with measured deepest invasion of at least 5 mm, lesion limited to the cervix uteri.
IB1	Clinically visible lesion no more than 4 cm in greatest dimension	IB1	Clinically visible lesion no more than 4 cm in greatest dimension	IB1	Invasive carcinoma at least 5 mm depth of stromal invasion, and less than 2 cm in greatest dimension
IB2	Clinically visible lesion more than 4 cm in greatest dimension	IB2	Clinically visible lesion more than 4 cm in greatest dimension	IB2	Invasive carcinoma at least 2 cm and less than 4 cm in greatest dimension
				IB3	Invasive carcinoma at least 4 cm in greatest dimension
II	Cervical carcinoma invades beyond uterus but not pelvic wall or lower third of vagina	II	Cervical carcinoma invades beyond uterus but not pelvic wall or lower third of vagina	II	The carcinoma invades beyond the uterus, but has not extended onto the lower third of the vagina or to the pelvic wall
IIA	Tumor without parametrial invasion	IIA	Tumor without parametrial invasion	IIA	Involvement limited to the upper two-thirds of the vagina without parametrial involvement
IIA1	Clinically visible lesion no more than 4 cm in greatest dimension	IIA1	Clinically visible lesion no more than 4 cm in greatest dimension	IIA1	Invasive carcinoma less than 4 cm in greatest dimension
IIA2	Clinically visible lesion larger than 4 cm in greatest dimension	IIA2	Clinically visible lesion larger than 4 cm in greatest dimension	IIA2	Invasive carcinoma at least 4 cm in greatest dimension
IIB	Tumor with parametrial invasion	IIB	Tumor with parametrial invasion	IIB	With parametrial involvement but not up to the pelvic wall
III	Tumor extends to pelvic wall and/ or involves lower third of vagina, and/or causes hydronephrosis or nonfunctioning kidney.	III	Tumor extends to pelvic wall and/ or involves lower third of vagina, and/or causes hydronephrosis or nonfunctioning kidney.	III	The carcinoma involves the lower third of the vagina and/or extends to the pelvic wall and/or causes hydronephrosis or nonfunctioning kidney and/or involves pelvic and/or para-aortic lymph nodes.
IIIA	Tumor involves lower third of vagina, no extension to pelvic wall.	IIIA	Tumor involves lower third of vagina, no extension to pelvic wall.	IIIA	The carcinoma involves the lower third of the vagina, with no extension to the pelvic wall

AJCC 7th		FIGO 2009		FIGO 2018	
Stage	**Description**	**Stage**	**Description**	**Stage**	**Description**
IIIB	Tumor extends to pelvic wall and/ or causes hydronephrosis or nonfunctioning kidney (including patients with T stage I to 3A with N1 and M0, or T stage 3B with any N and M0).	IIIB	Tumor extends to pelvic wall and/ or causes hydronephrosis or nonfunctioning kidney.	IIIB	Extension to the pelvic wall and/or hydronephrosis or nonfunctioning kidney (unless known to be due to another cause)
				IIIC	Involvement of pelvic and/or para-aortic lymph nodes, irrespective of tumor size and extent (with r and p notations)
				IIIC1	Pelvic lymph node metastasis only
				IIIC2	Para-aortic lymph node metastasis
IVA	Tumor invades mucosa of bladder or rectum, and/or extends beyond true pelvis (bullous edema is not sufficient to classify a tumor as T4).	IVA	Tumor invades mucosa of bladder or rectum, and/or extends beyond true pelvis (bullous edema is not sufficient to classify a tumor as T4).	IVA	Spread to adjacent pelvic organs
IVB	Distant metastasis (including peritoneal spread, involvement of supraclavicular, mediastinal, or para-aortic lymph nodes, lung, liver, or bone)	IVB	Distant metastasis (including peritoneal spread, involvement of supraclavicular, mediastinal, or para-aortic lymph nodes, lung, liver, or bone)	IVB	Spread to distant organs

AJCC, American Joint Committee on Cancer;FIGO, International Federation of Gynecology and Obstetrics.

Difference between AJCC 7th and FIGO 2009 is that any T stage from I to IIIB with positive nodes goes up to IIIB given M0 for AJCC 7th, whereas, in FIGO 2009, patients with positive nodes remained at individual stage I to IIIB given M0.

Table 2.

Clinical and Demographic Characteristics of the Study Cohort

Characteristic	n (%)
Total	62,212
Age (y)	
Younger than 40	14,706 (23.6)
40–49	16,167 (26.0)
50–59	14,303 (23.0)
60–69	9,498 (15.3)
70–79	5,007 (8.0)
80 or older	2,531 (4.1)
Race	
White	38,113 (61.3)
Black	9,718 (15.6)
Hispanic	7,941 (12.8)
Other	3,110 (5.0)
Unknown	3,330 (5.4)
Insurance status	
Not insured	6,069 (9.8)
Private	28,095 (45.2)
Medicaid	14,170 (22.8)
Medicare	11,762 (18.9)
Other government	761 (1.2)
Unknown	1,355 (2.2)
Median ZIP code household income ($)	
Less than 30,000	11,690 (18.8)
30,000–35,999	12,545 (20.2)
36,000–45,999	17,062 (27.4)
46,000 or more	18,949 (30.5)
Not available	1,966 (3.2)
ZIP code percentage of adults not graduating from high school	
At least 29	15,522 (25.0)
20–28.9	15,997 (25.7)
14–19.9	13,051 (21.0)
Less than 14	15,664 (25.2)
Not available	1,978 (3.2)
Urban or rural	
Metropolitan	49,425 (79.4)
Urban	9,875 (15.9)
Rural	1,119 (1.8)
Unknown	1,793 (2.9)
Charlson/Deyo comorbidity index	

Characteristic	n (%)
0	52,948 (85.1)
1	7,259 (11.7)
At least 2	2,005 (3.2)
Year of Diagnosis	
2004	3,506 (5.6)
2005	3,449 (5.5)
2006	3,349 (5.4)
2007	3,606 (5.8)
2008	4,289 (6.9)
2009	4,846 (7.8)
2010	6,392 (10.3)
2011	6,425 (10.3)
2012	6,436 (10.3)
2013	6,400 (10.3)
2014	6,792 (10.9)
2015	6,722 (10.8)
Grade	
Well	5,416 (8.7)
Moderate	19,977 (32.1)
Poorly	20,111 (32.3)
Unknown	16,708 (26.9)
Histology	
Squamous cell	43,794 (70.4)
Adenocarcinoma	10,620 (17.1)
Adenosquamous	1,956 (3.1)
Other or unknown	5,842 (9.4)
Primary treatment	
Primary surgery	24,472 (39.4)
Primary radiation	31,823 (51.1)
Chemotherapy only	1,390 (2.2)
Unknown or no treatment	4,527 (7.3)
Facility region	
Eastern	9,661 (15.5)
South	14,276 (22.9)
Midwest	16,110 (25.9)
West	7,459 (12.0)
Unknown	14,706 (23.6)
Facility type	
Community cancer program	3,243 (5.2)
Comprehensive community cancer program	17,502 (28.1)
Academic or research program	21,519 (34.6)
Integrated network cancer program	5,242 (8.4)

Characteristic	n (%)
Unknown	14,706 (23.6)

Table 3.

Five-Year Overall Survival Rate by Stage for the Three Staging Schemas

	AJCC 7th		FIGO 2009		FIGO 2018	
Staging	**Total Patients (N=62,212)**	**5-Year Survival (n=55,490)**	**Total Patients (N=62,212)**	**5-Year Survival (n=55,490)**	**Total Patients (N = 62,212)**	**5-Year Survival (n=55,490)**
I	3,521 (5.7)	84.3 (82.8–85.7)	3,753 (6.0)	82.6 (81.1–84.0)	3,328 (5.3)	85.6 (84.1–87.0)
IA	2,940 (4.7)	93.7 (92.6–94.6)	2,998 (4.8)	93.4 (92.2–94.3)	2,887 (4.6)	94.1 (93.0–95.0)
IA1	2,842 (4.6)	95.7 (94.3–96.8)	2,858 (4.6)	95.4 (94.0–96.5)	2,812 (4.5)	95.8 (94.4–96.9)
IA2	872 (1.4)	94.8 (92.0–96.6)	893 (1.4)	94.4 (91.7–96.2)	844 (1.4)	95.0 (92.2–96.7)
IB	4,576 (7.4)	79.7 (78.5–80.9)	1,785 (2.9)	73.5 (71.2–75.7)	1,522 (2.4)	75.9 (73.4–78.2)
IB1	7,660 (12.3)	86.6 (85.4–87.7)	10,547 (17.0)	85.5 (84.5–86.3)	4,480 (7.2)	91.6 (90.4–92.6)
IB2	3,114 (5.0)	74.4 (72.1–76.5)	4,847 (7.8)	70.9 (69.2–72.5)	4,120 (6.6)	83.3 (81.8–84.8)
IB3					3,790 (6.1)	76.1 (74.3–77.8)
II	663 (1.1)	55.0 (50.4–59.3)	927 (1.5)	53.9 (50.0–57.6)	617 (1.0)	56.1 (51.4–60.5)
IIA	1,459 (2.3)	64.6 (61.9–67.1)	939 (1.5)	61.4 (57.8–64.8)	796 (1.3)	63.4 (59.5–67.0)
IIA1	505 (0.8)	73.0 (66.2–78.7)	899 (1.4)	68.0 (63.9–71.8)	742 (1.2)	70.3 (65.9–74.3)
IIA2	779 (1.3)	64.4 (59.2–69.1)	1,593 (2.6)	61.7 (58.6–64.6)	1,101 (1.8)	65.3 (61.6–68.6)
IIB	9,039 (14.5)	63.5 (62.4–64.7)	11,487 (18.5)	61.3 (60.3–62.4)	8,904 (14.3)	63.9 (62.7–65.0)
III	416 (0.7)	39.6 (34.3–45.0)	747 (1.2)	39.2 (35.2–43.3)	407 (0.7)	39.3 (33.9–44.7)
IIIA	964 (1.5)	40.8 (37.1–44.3)	1,385 (2.2)	40.5 (37.5–43.6)	954 (1.5)	40.7 (37.1–44.3)
IIIB	14,220 (22.9)	45.2 (44.2–46.2)	7,912 (12.7)	38.4 (37.2–39.6)	5,177 (8.3)	41.4 (39.9–42.9)
IIIC					5,350 (8.6)	46.3 (44.8–47.8)
IIIC1					4,625 (7.4)	60.8 (58.7–62.8)
IIIC2					1,114 (1.8)	37.5 (33.3–41.7)
IVA	1,890 (3.0)	24.0 (21.7–26.3)	1,890 (3.0)	24.0 (21.7–26.3)	1,890 (3.0)	24.0 (21.7–26.3)
IVB	6,752 (10.9)	14.7 (13.7–15.8)	6,752 (10.9)	14.7 (13.7–15.8)	6,752 (10.9)	14.7 (13.7–15.8)

AJCC, American Joint Committee on Cancer;FIGO, International Federation of Gynecology and Obstetrics. Data are n (%) or % (95% CI).

Table 4.

Five-Year Survival Rate for FIGO 2018 for Patients With Positive Nodes, Stratified by the Method of Detection

	Pathologic Nodes Positive		Clinical Nodes Positive	
FIGO 2018	**Patients (n=3,439)**	**5-Year Survival**	**Patients (n=7,650)**	**5-Year Survival**
IIIC	1,228 (31.2)	52.2 (49.1–55.3)	4,122 (31.9)	44.5 (42.7–46.2)
IIIC1	1,842 (46.8)	70.9 (67.8–73.7)	2,783 (21.6)	53.3 (50.5–56.1)
IIIC2	369 (9.4)	45.1 (38.3–51.7)	745 (5.8)	32.9 (27.6–38.3)

FIGO, International Federation of Gynecology and Obstetrics.

Data are n (%) or % (95% CI).

Pathologic nodes positive patients include women with positive pathologic nodes and any clinical nodes status. After the selection of pathologic nodes positive patients, clinical nodes positive patients are women with negative or unknown pathologic nodes status but having positive clinical nodes.

Table 5.

Five-Year Survival Rate for Women Based on Classification of Women Based on Nodal Status for FIGO Stages I–IIIB Tumors

	Patients With Positive Nodes				Patients With Negative Nodes			
Stage	FIGO 2009	FIGO 2009, 5-Year Survival	FIGO 2018	FIGO 2018, 5-Year Survival	FIGO 2009	FIGO 2009, 5-Year Survival	FIGO 2018	FIGO 2018, 5-Year Survival
IA1	46 (1.6)	74.7 (56.8–86.0)	46 (1.6)	74.7 (56.8–86.0)	2,812 (98.4)	95.8 (94.4–96.9)	2,812 (98.4)	95.8 (94.4–96.9)
IA2	49 (5.5)	82.4 (62.5–92.4)	49 (5.5)	82.4 (62.5–92.4)	844 (94.5)	95.0 (92.2–96.7)	844 (94.5)	95.0 (92.2–96.7)
IB1	1,675 (15.9)	73.9 (71.0–76.7)	459 (9.3)	78.9 (73.6–83.2)	8,872 (84.1)	87.5 (86.6–88.4)	4,480 (90.7)	91.6 (90.4–92.6)
IB2	1,329 (27.4)	58.8 (55.2–62.2)	1,000 (19.5)	72.1 (68.1–75.7)	3,518 (72.6)	75.3 (73.5–77.1)	4,120 (80.5)	83.3 (81.8–84.8)
IB3			1,545 (29.0)	60.5 (57.1–63.6)			3,790 (71.0)	76.1 (74.3–77.8)
IIA1	157 (17.5)	56.2 (45.0–65.9)	157 (17.5)	56.2 (45.0–65.9)	742 (82.5)	70.3 (65.9–74.3)	742 (82.5)	70.3 (65.9–74.3)
IIA2	492 (30.9)	52.7 (46.5–58.5)	492 (30.9)	52.7 (46.5–58.5)	1,101 (69.1)	65.3 (61.6–68.6)	1,101 (69.1)	65.3 (61.6–68.6)
IIIA	431 (31.1)	40.0 (34.2–45.7)	431 (31.1)	40.0 (34.2–45.7)	954 (68.9)	40.7 (37.1–44.3)	954 (68.9)	40.7 (37.1–44.3)
IIIB	2,735 (34.6)	32.4 (30.3–34.5)	2,735 (34.6)	32.4 (30.3–34.5)	5,177 (65.4)	41.4 (39.9–42.9)	5,177 (65.4)	41.4 (39.9–42.9)
IVA	788 (41.7)	23.8 (20.1–27.6)	788 (41.7)	23.8 (20.1–27.6)	1,102 (58.3)	24.1 (21.2–27.1)	1,102 (58.3)	24.1 (21.2–27.1)
IVB	4,965 (73.5)	14.5 (13.2–15.8)	4,965 (73.5)	14.5 (13.2–15.8)	1,787 (26.5)	15.4 (13.4–17.6)	1,787 (26.5)	15.4 (13.4–17.6)

FIGO, International Federation of Gynecology and Obstetrics.

Data are n (%) or % (95% CI).

Patients with tumors stage as not otherwise specified not included.