

Analytic Considerations When Shifting from Direct-Coded to CS Derived AJCC Staging

Jerri Linn Phillips, M.A, C.T.R.



*A multidisciplinary program of the
American College of Surgeons*

Background

- **Prior Review:**
 - 2004 Cases
 - Compared Physician-assigned to registrar CS derived stage group
 - Completeness
 - Consistency
 - Completeness varied by site
 - Consistency – differences largely due to information unknown or unused by either physician or registrar but not both
 - Not random: Therefore, there may be an effect on data analysis

Procedures

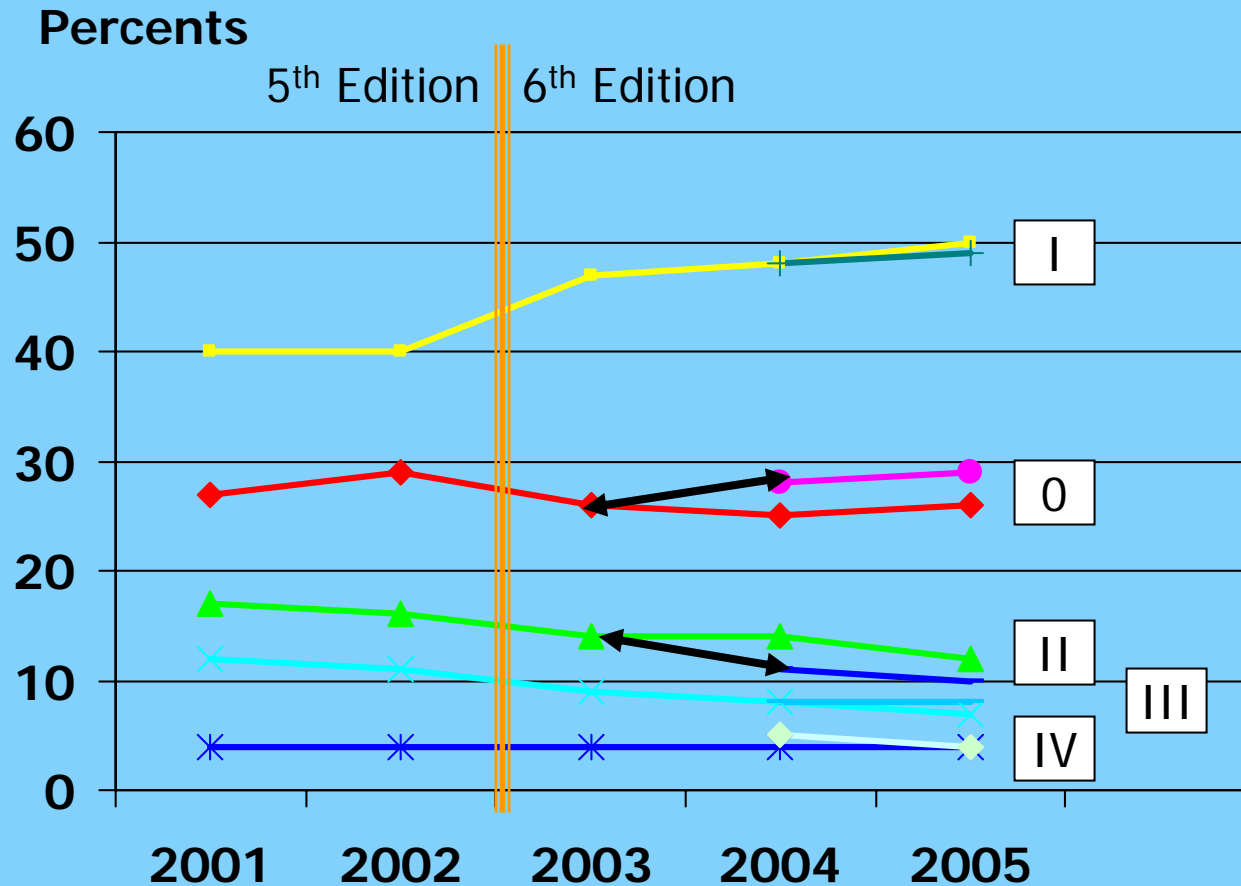
- **2001-2005: Using Stage to Describe Trends (percents of staged cases)**
 - 6 Sites
 - CS 01.02.xx (2004) and 01.03.xx (2005)
 - Directly-coded Combined Stage – 5th and 6th Edition (Physician coded)
 - Stage trend over the 5 years with CS for the last two – percentage distributions
- **2005 Cases: Using Stage in Tabulations**
 - Same 6 Sites
 - CS Version 01.03.xx
 - Directly-coded Combined Stage – 5th and 6th Edition (Physician coded)
 - Stage by Age, Sex and Race/Ethnicity
 - Treatment by Stage

Study Cases 2005:

Direct-Coded Combined Stage and **CS Derived Stage** Compared

	Cases	Direct = Derived Stage	0	I	II	III	IV	UNK
Melanoma of Skin	23,118	81%	22 / 25	43 / 43	10 / 9	7 / 7	3 / 4	15 / 12
Prostate	123,039	85%	0 / >0	1 / >0	76 / 79	7 / 7	5 / 6	11 / 7
Rectum	22,129	81%	7 / 9	24 / 25	19 / 19	21 / 21	13 / 13	15 / 15
Lung	144,257	84%	>0 / >0	20 / 21	6 / 6	24 / 25	37 / 41	13 / 7
Ovary	14,599	83%	>0 / >0	20 / 21	8 / 8	40 / 38	21 / 26	11 / 7

Melanoma of Skin: 5 Year Trend



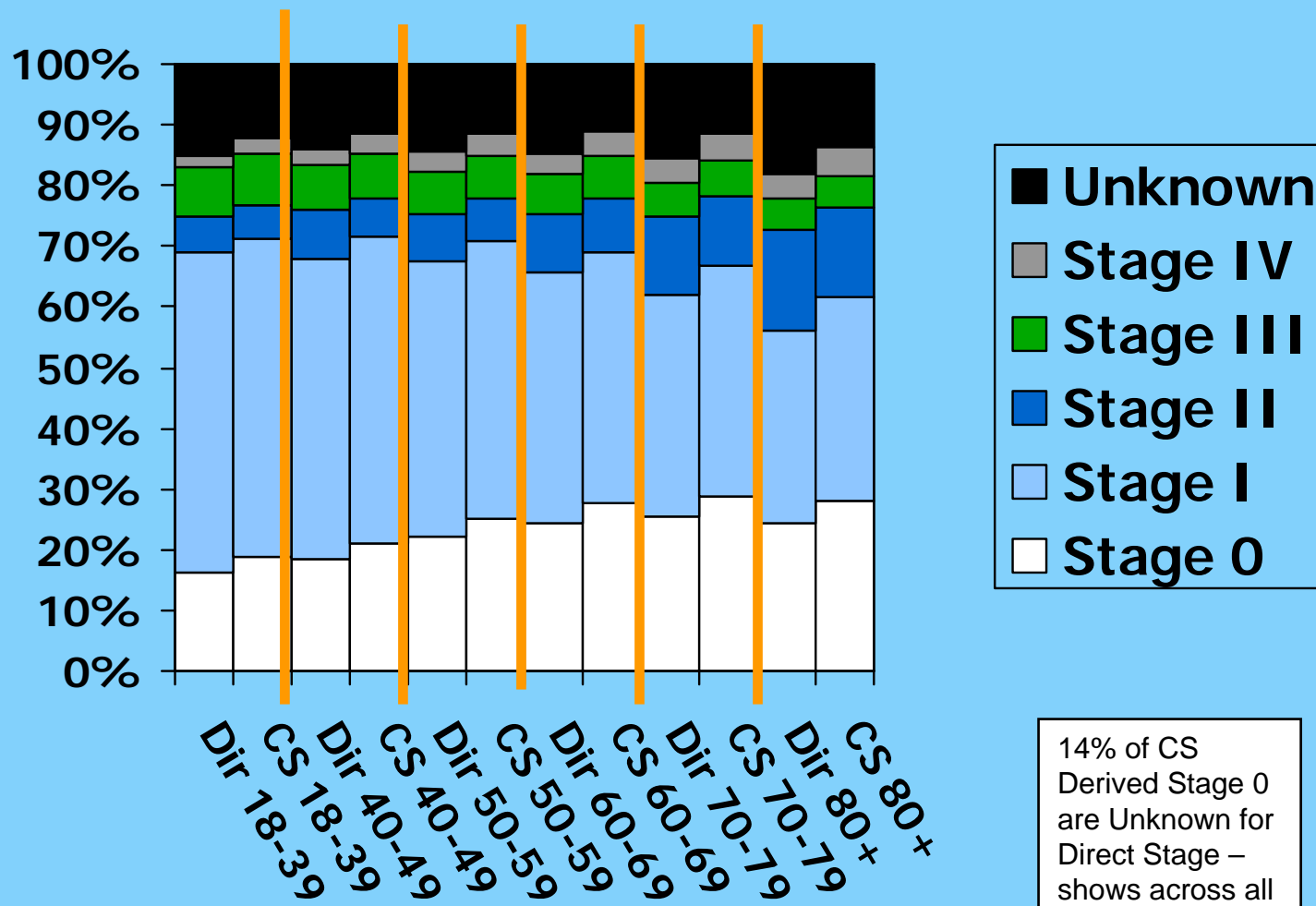
AJCC staging definitions changed from 5th to 6th edition (2002 to 2003), affecting stages I, II and III.

14% of CS Derived Stage 0 are Unknown for Direct Stage.

Percent Unknown Direct Stage by Year				
12	12	11	16	15

2005: Demographics

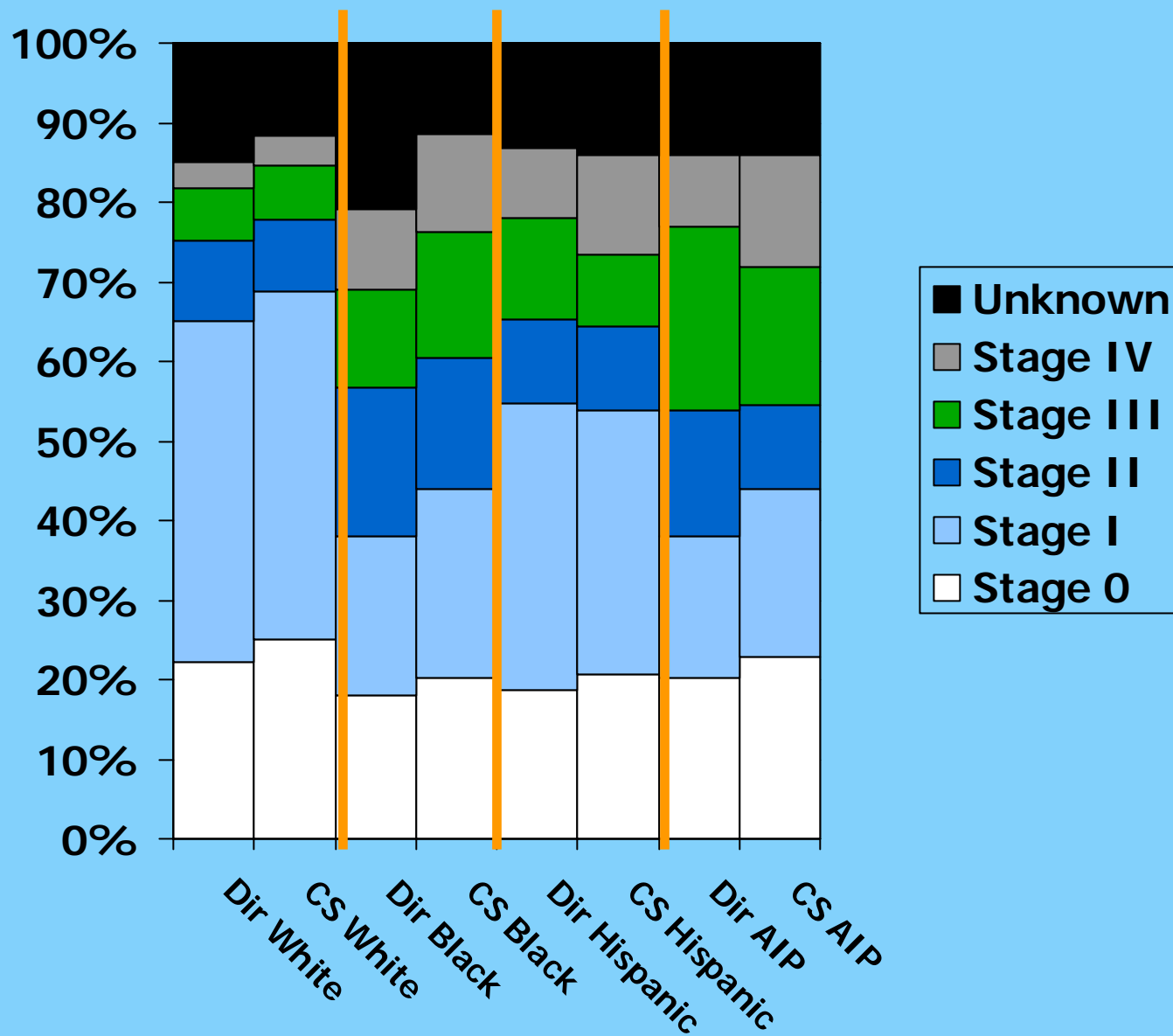
Age: Melanoma of Skin



14% of CS
Derived Stage 0
are Unknown for
Direct Stage –
shows across all
age groups

2005: Demographics

Race/Ethnicity: Melanoma of Skin



Treatment Choices: Melanoma of Skin

Percents: Direct/**CS Derived**

Treatment / Stage	0	I	II	III	IV
Surgery Only	98	99	90	55	17
	98	99	90	57	16
Radiation Only	>0	0	0	2	14
	>0	0	0	1	13
Surgery and Radiation	>0	>0	2	5	5
	>0	>0	2	4	5
Surgery Plus BRM	>0	>0	5	20	3
	>0	>0	5	22	3
No Treatment	1	>0	>0	3	27
	1	>0	>0	2	28

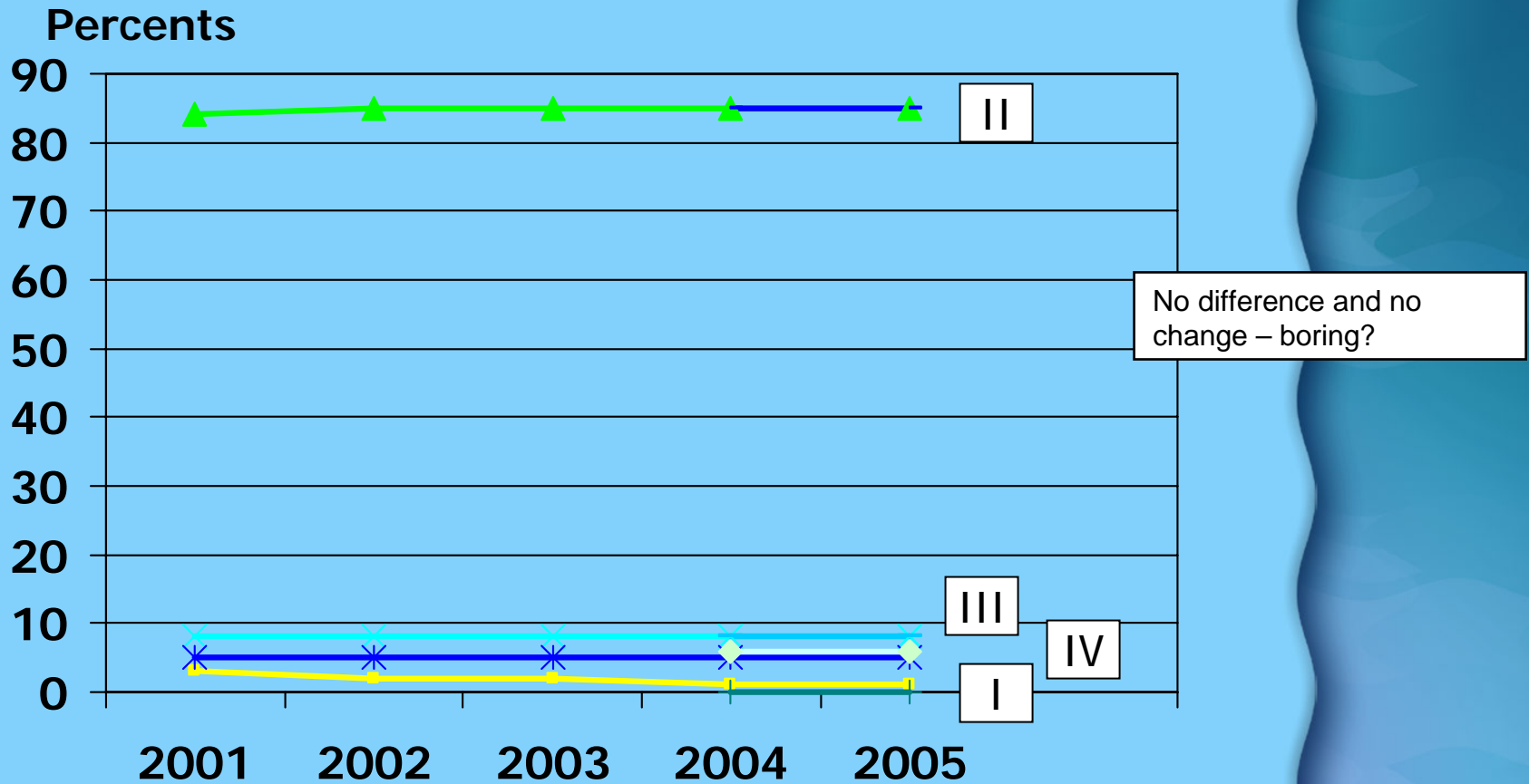
Treatment Choices: Melanoma of Skin

Percents: Direct/**CS Derived**

Treatment / Stage	0	I	II	III	IV
Surgery Only					
Local Tumor Excision	18	10	11	9	39
	18	10	11	9	39
Biopsy followed by Gross Excision	26	17	10	10	6
	28	18	10	10	7
Wide excision (> 1 cm margins)	56	72	76	76	46
	54	71	77	77	43

Used all subcategories of Local Tumor Excision, all categories of Biopsy followed by Gross Excision, both >1 cm and >2 cm for Wide excision

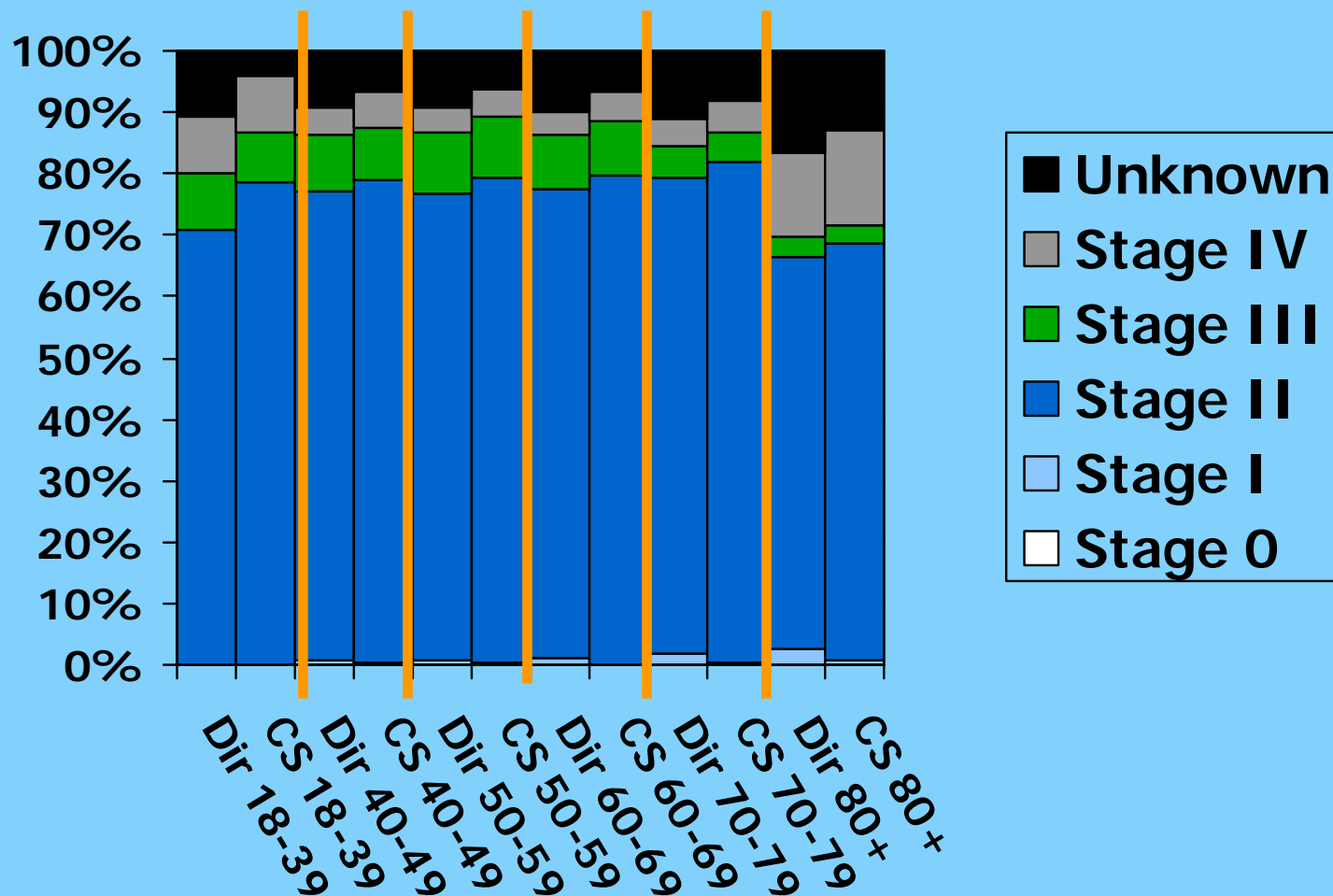
Prostate: 5 Year Trend



Percent Unknown Direct Stage by Year				
5	5	7	11	11

2005: Demographics

Age: Prostate



Only 75 patients were under age 40.

Treatment Choices: Prostate

Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Surgery Only	48	41	65	15
	87	42	68	17
Radiation Only	27	27	3	4
	0	26	3	4
Hormone Only	3	3	2	31
	>0	3	2	30
Surgery and Hormone	2	2	5	8
	1	2	5	8
Radiation and Hormone	13	17	11	16
	>0	17	11	15
No Treatment	10	8	1	14
	6	8	>0	14

71% of the cases direct-staged Stage I were staged II by CS – and they appear to have been treated as if they were Stage II.

Stage I is cT1aN0M0G1 (incidental findings in < 5% of resected material) – Direct-coded may have identified other T1 as Stage I.

Treatment Choices: Prostate

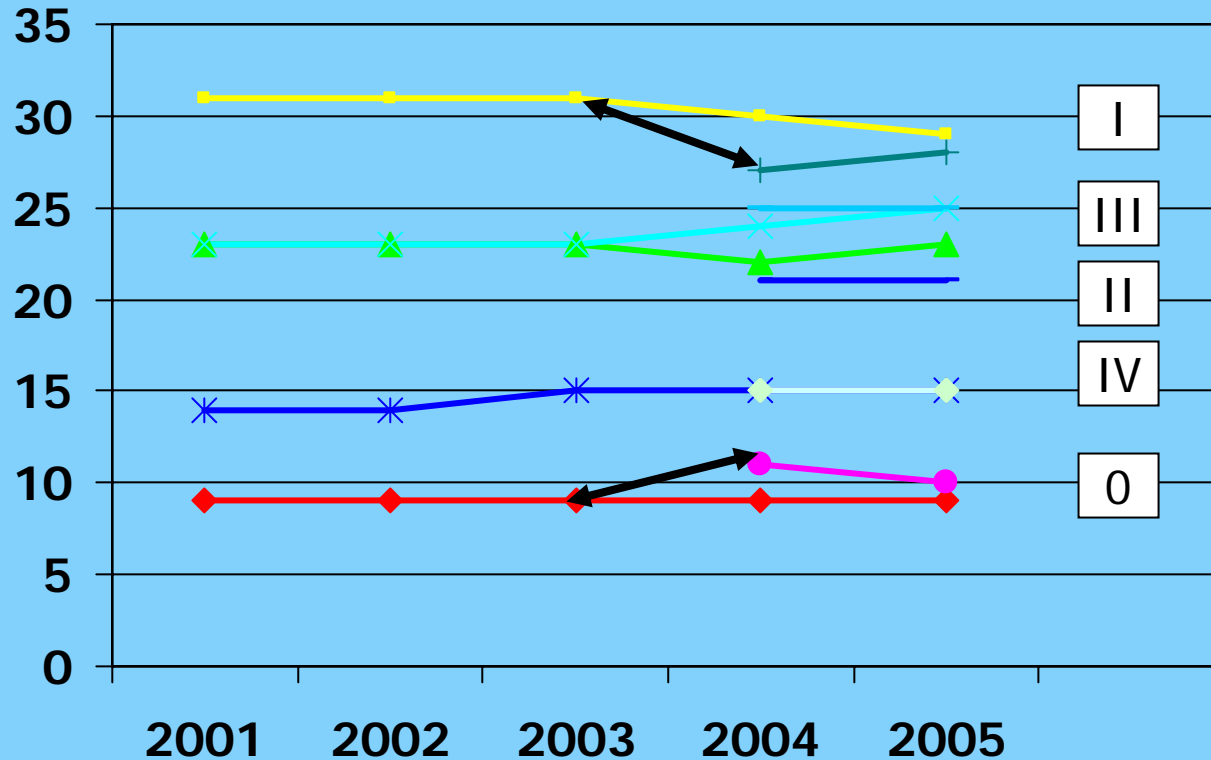
Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Radiation Only				
Beam Only	38	45	63	91
		45	65	93
Brachytherapy Only	39	44	11	7
		44	10	5
Beam w/ Brachytherapy Boost	14	9	21	2
		9	23	1
Brachytherapy w/ Beam Boost	1	2	4	0
		2	3	>0

Cases that physicians staged I that got radiation were generally similar to CS Stage II. (No CS Stage I cases were treated with Radiation only).

Rectum: 5 Year Trend

Percents

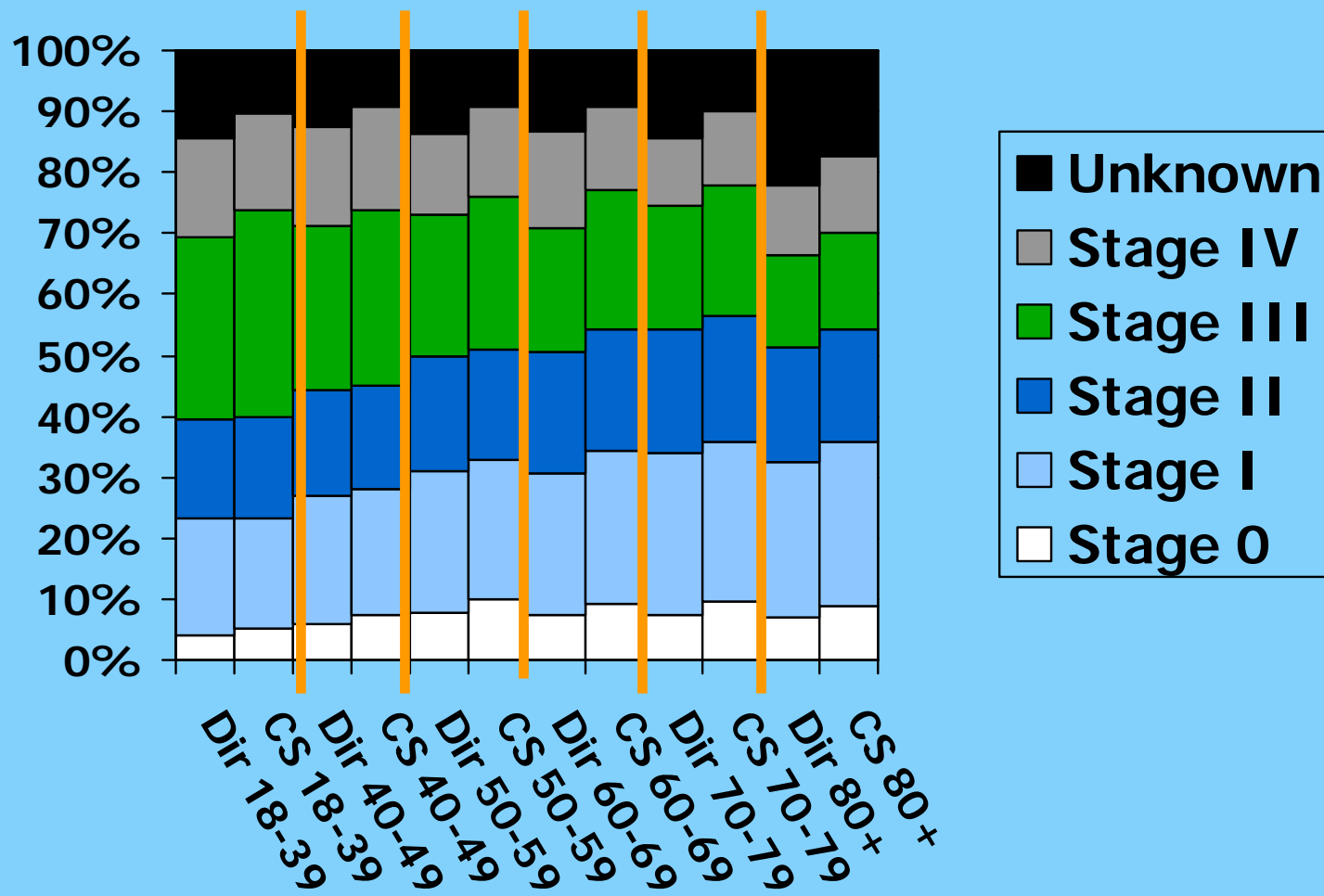


Percent Unknown Direct Stage by Year				
15	15	15	16	15

Between 01.02 and 01.03 there was a change in handling of lymph node extension for unknown numbers of lymph nodes that was not taken into account for 2004. It is not clear, however, how that affected this graphic. The distinction was between Stages II and III, but neither differed between 2004 and 2005. Whole stage groups not changed from 5th edition to 6th; changes made within categories.

2005: Demographics

Age: Rectum



Treatment Choices: Rectum

Percents: Direct/**CS Derived**

Treatment / Stage	0	I	II	III	IV
Surgery Only	85	61	19	16	9
	83	64	20	15	9
Radiation and Chemotherapy	1	3	12	8	20
	1	4	11	7	19
Surgery and Chemotherapy	>0	2	4	9	13
	>0	2	4	8	13
Surgery, Radiation and Chemotherapy	5	25	54	60	16
	3	21	55	63	17
No Treatment	7	4	3	2	17
	10	4	3	2	17

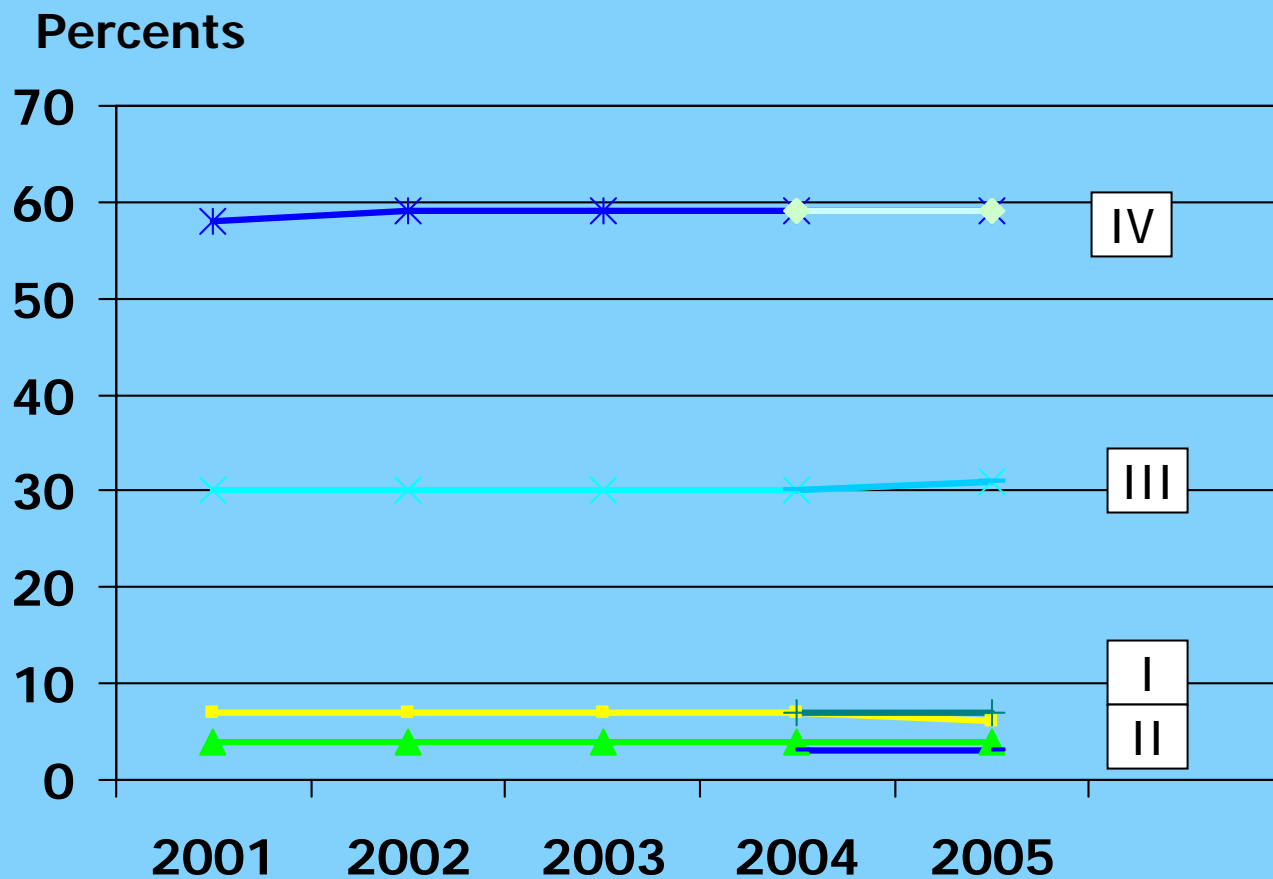
Are rectal excision biopsies not consistently recorded as surgery? For rectum, Stage 0 includes intraepithelial or invasion of lamina propria (intramucosal). Still, is nontreatment possible for such a diagnosis?

Treatment Choices: Rectum

Percents: Direct/**CS Derived**

Treatment / Stage	0	I	II	III	IV
Surgery Only					
Local tumor excision, NOS	79	34	6	3	10
	79	35	6	4	9
Wedge or segmental resection	15	48	65	63	61
	16	47	64	64	62
Total proctectomy	2	10	17	20	11
	2	10	18	20	11
Total proctocolectomy	1	1	2	2	3
	>0	2	2	2	2

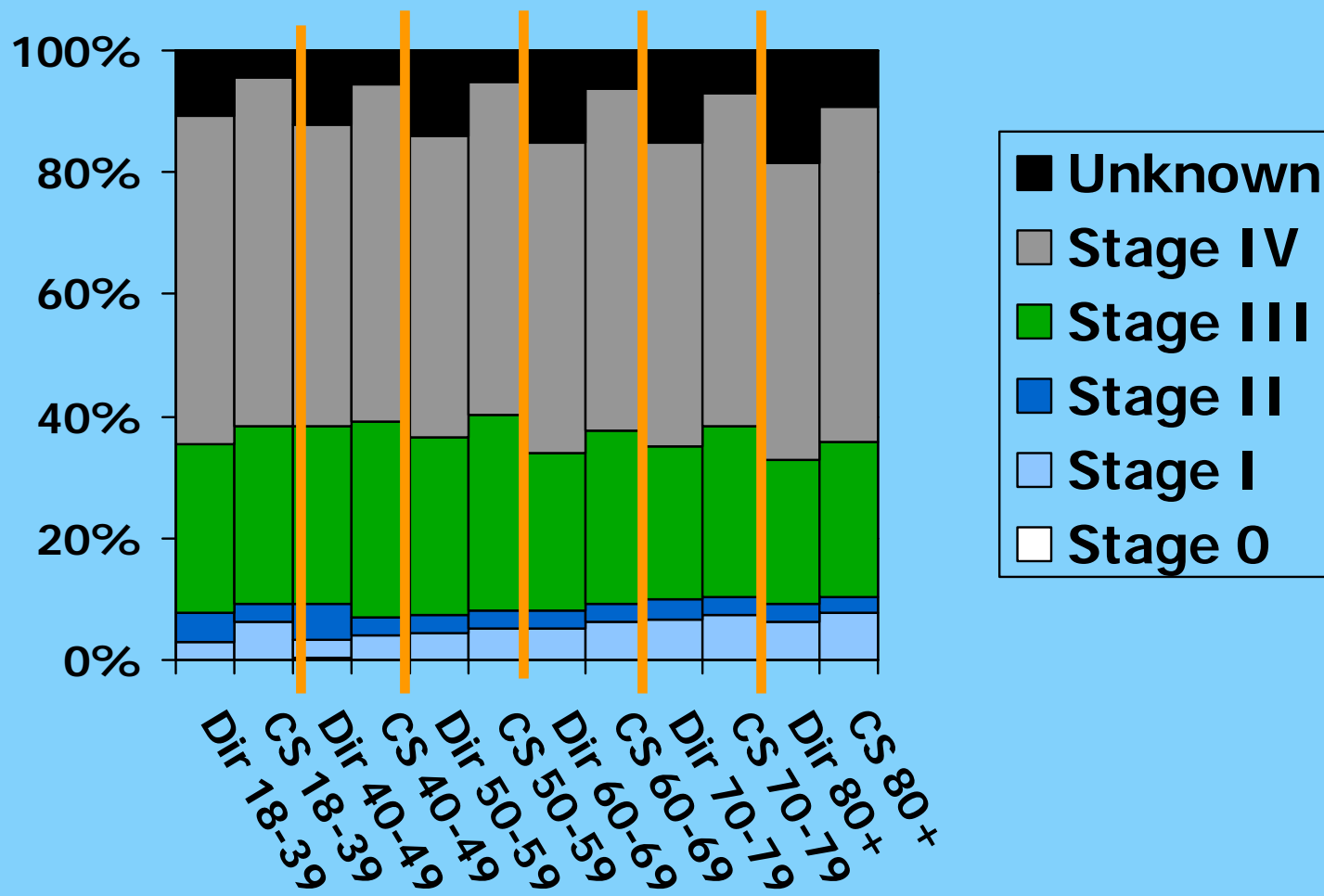
Lung Small Cell Carcinoma: 5 Year Trend



Percent Unknown Direct Stage by Year				
9	9	10	15	15

2005: Demographics

Age: Small Cell Carcinoma of Lung



Treatment Choices: Small Cell Carcinoma of Lung

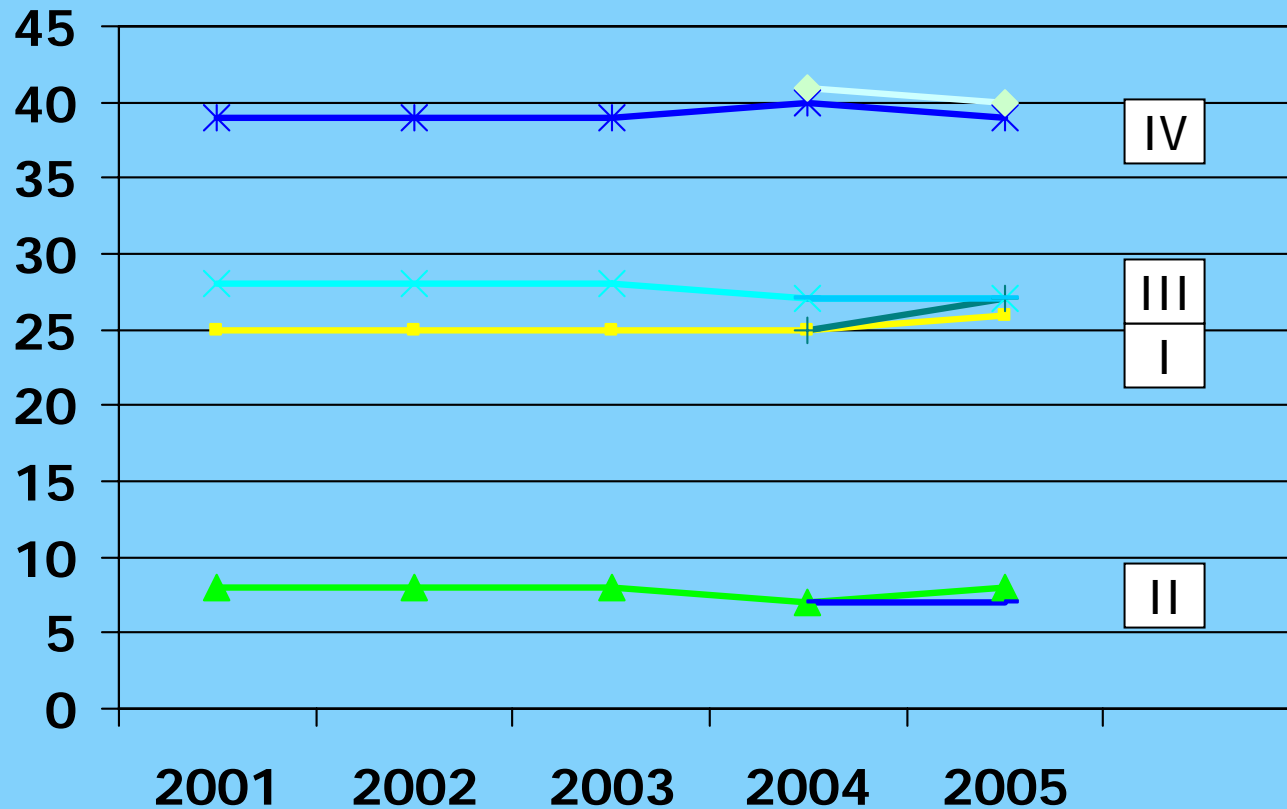
Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Chemotherapy Only	16	18	21	39
	15	14	22	39
Radiation and Chemotherapy	38	50	56	27
	39	50	56	27
No Treatment	15	13	15	23
	18	11	15	24

22% overall had no treatment

Lung Nonsmall Cell Carcinoma: 5 Year Trend

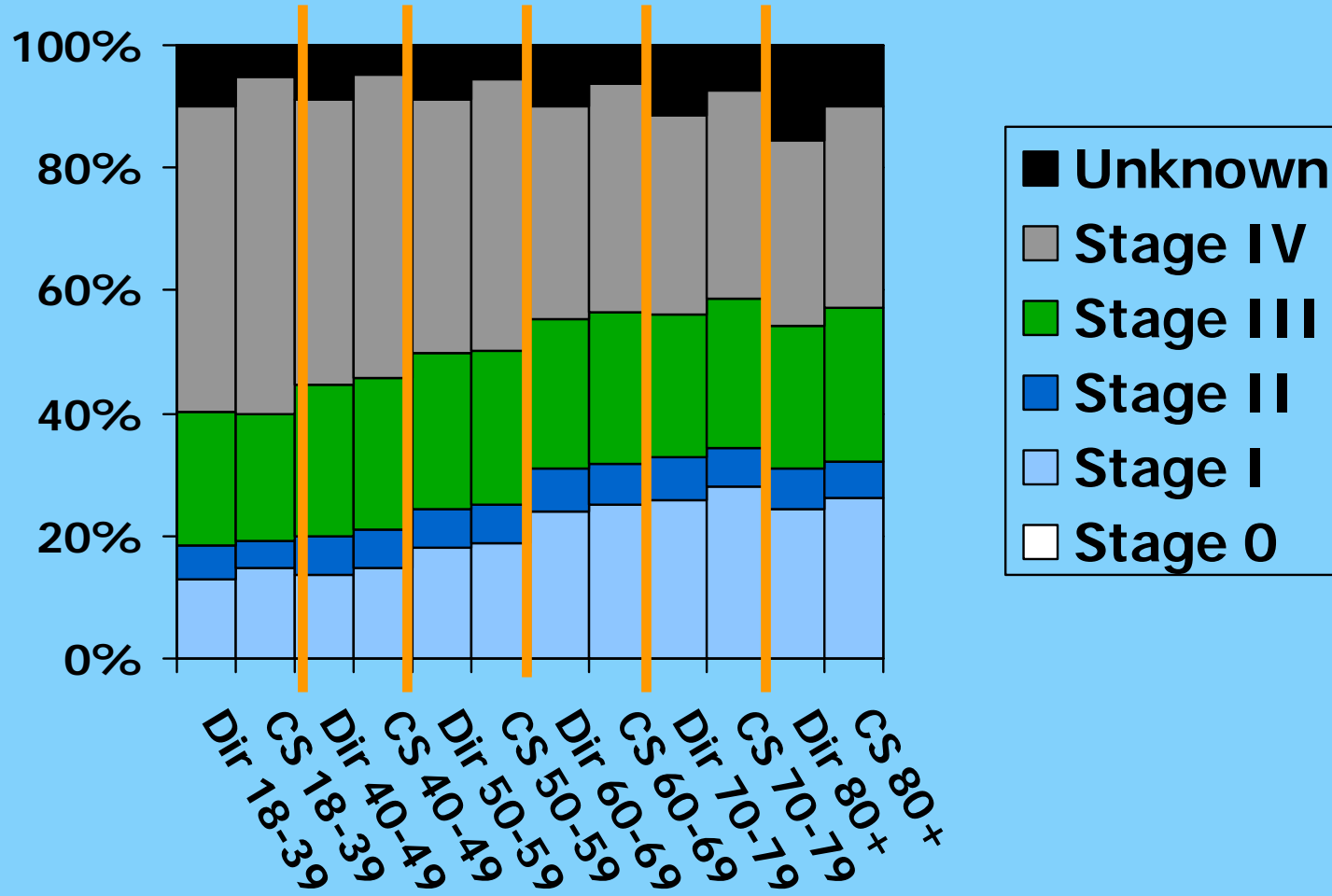
Percents



Percent Unknown Direct Stage by Year				
7	7	8	11	11

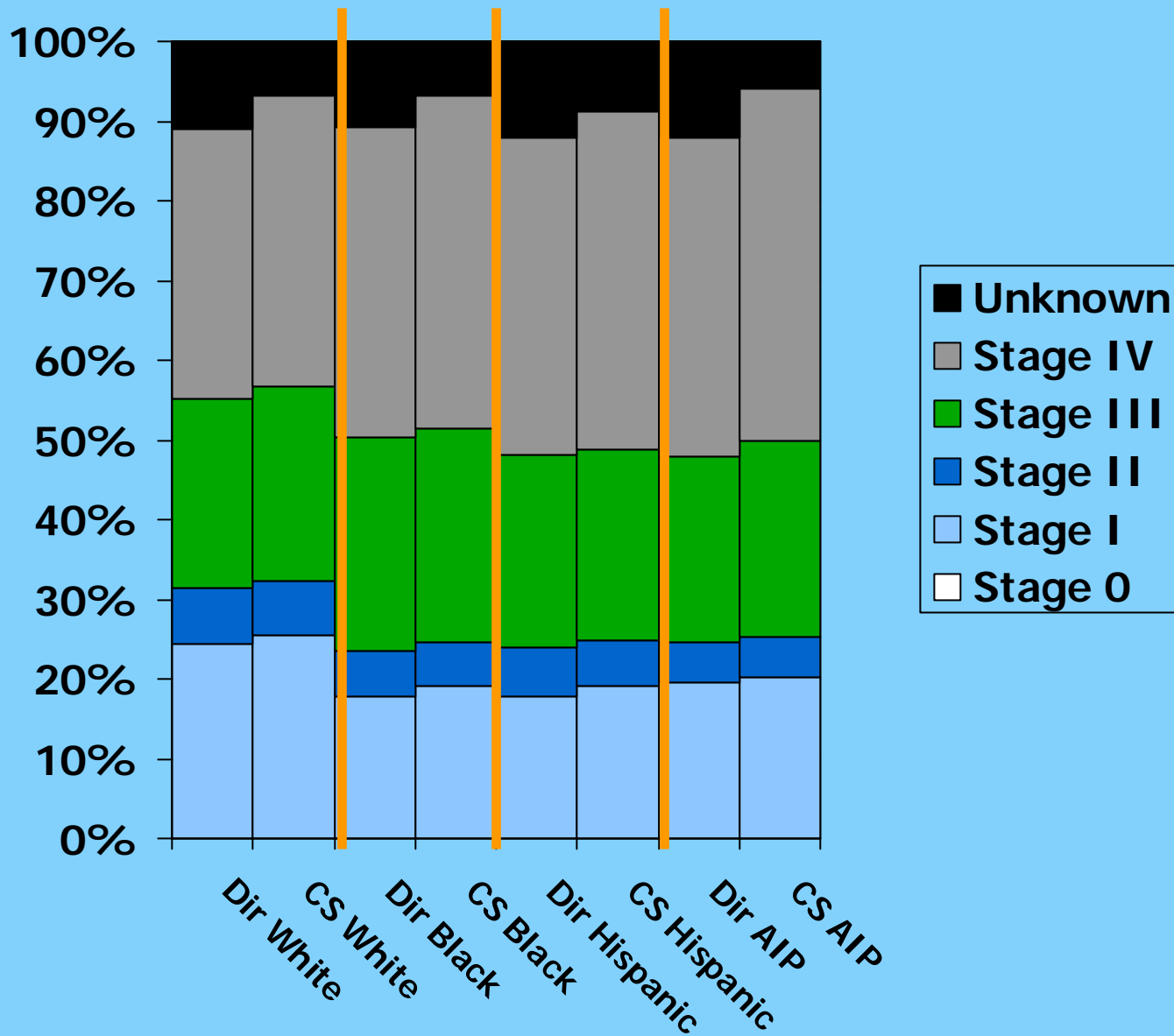
2005: Demographics

Age: Nonsmall Cell Carcinoma of the Lung



2005: Demographics

Race/Ethnicity: Nonsmall Cell Carcinoma of the Lung



Treatment Choices: Non-small Cell Carcinoma of the Lung

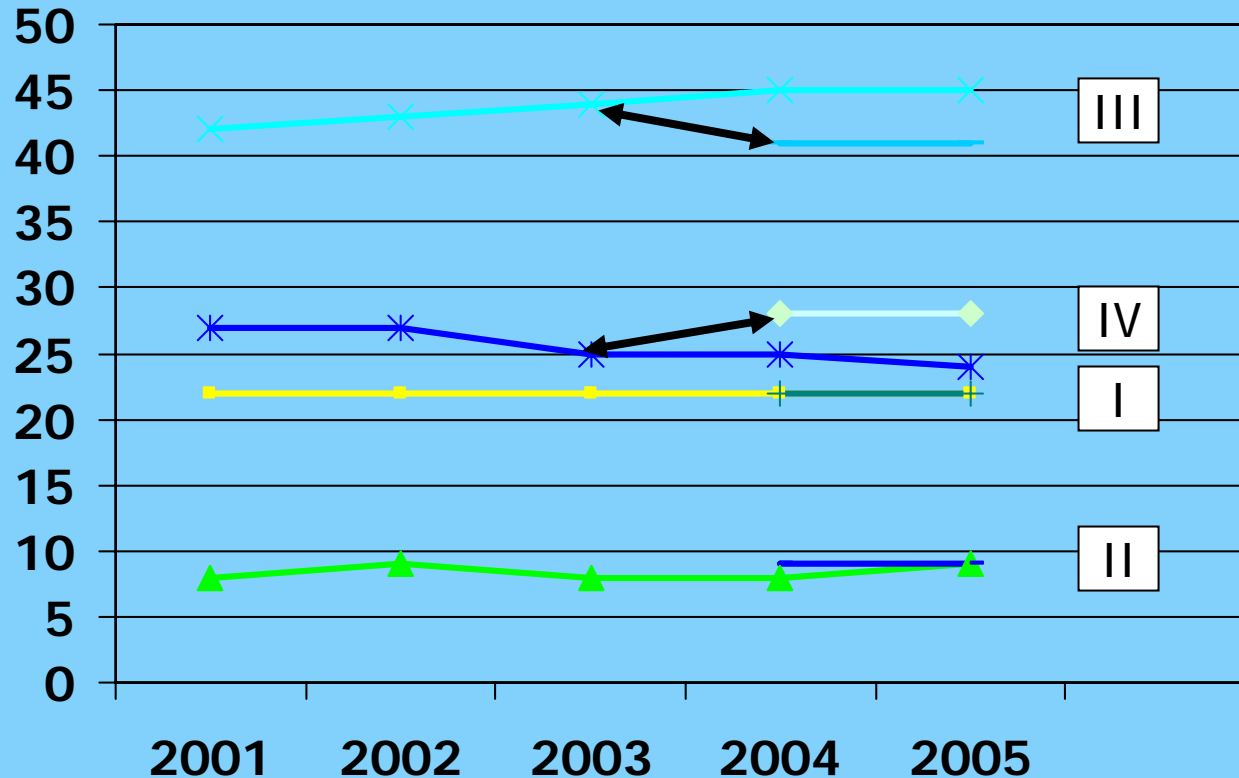
Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Surgery Only	60	28	6	2
	60	30	6	2
Radiation Only	9	9	11	20
	9	8	11	20
Chemotherapy Only	2	4	13	21
	2	4	13	21
Radiation and Chemotherapy	5	14	38	25
	5	14	35	25
No Treatment	10	11	19	26
	11	9	20	27

22% overall had no treatment

Ovary: 5 Year Trend

Percents



Stage IV differs from Stage III in having distant mets. Stage III requires knowledge of peritoneal mets outside of the pelvis.

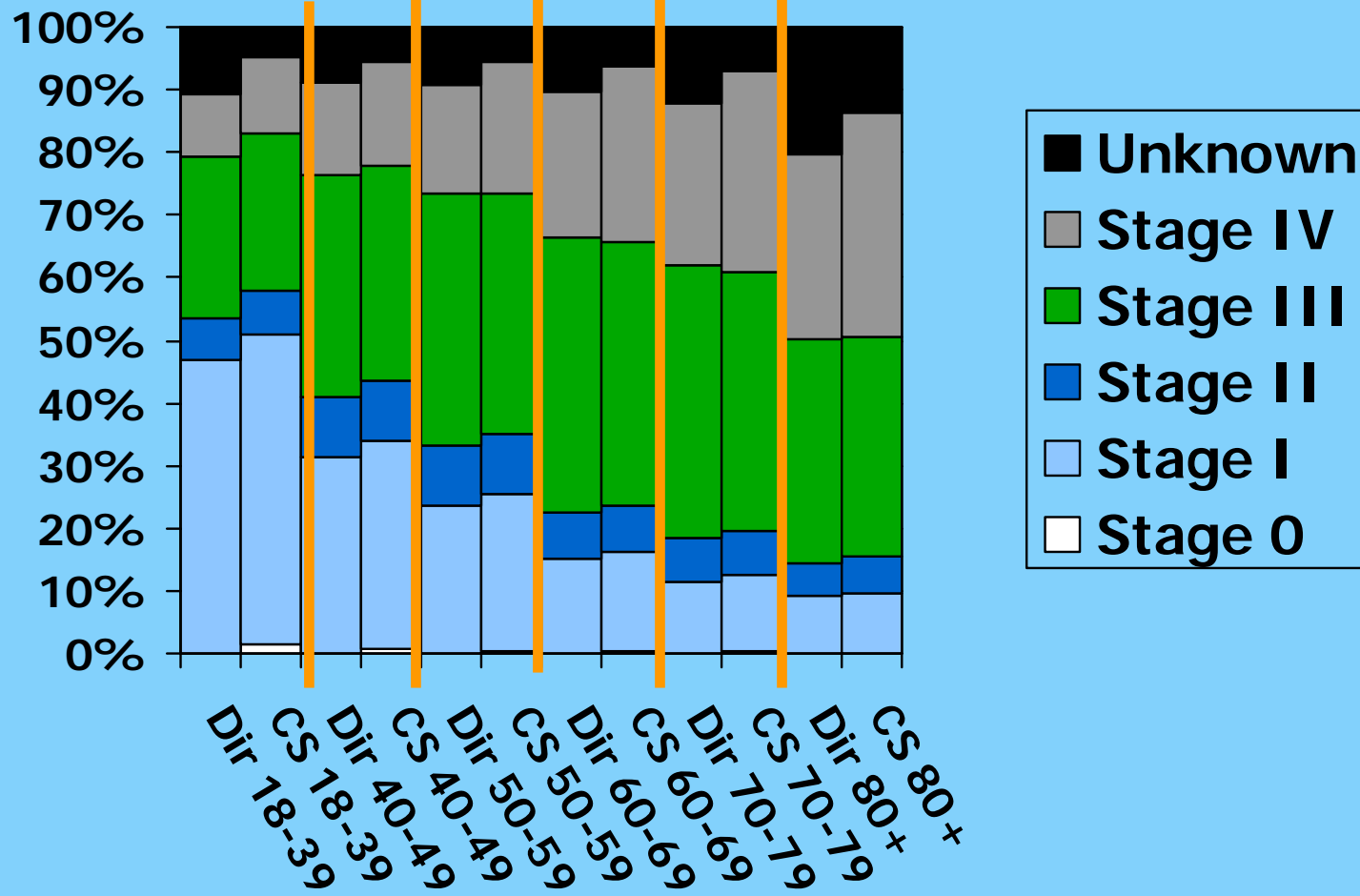
Of cases CS called Unknown in 2005, physicians called 23% Stage III.

Of cases physicians called unknown in 2005, CS called 20% Stage IV.

Percent Unknown Direct Stage by Year				
9	9	10	11	11

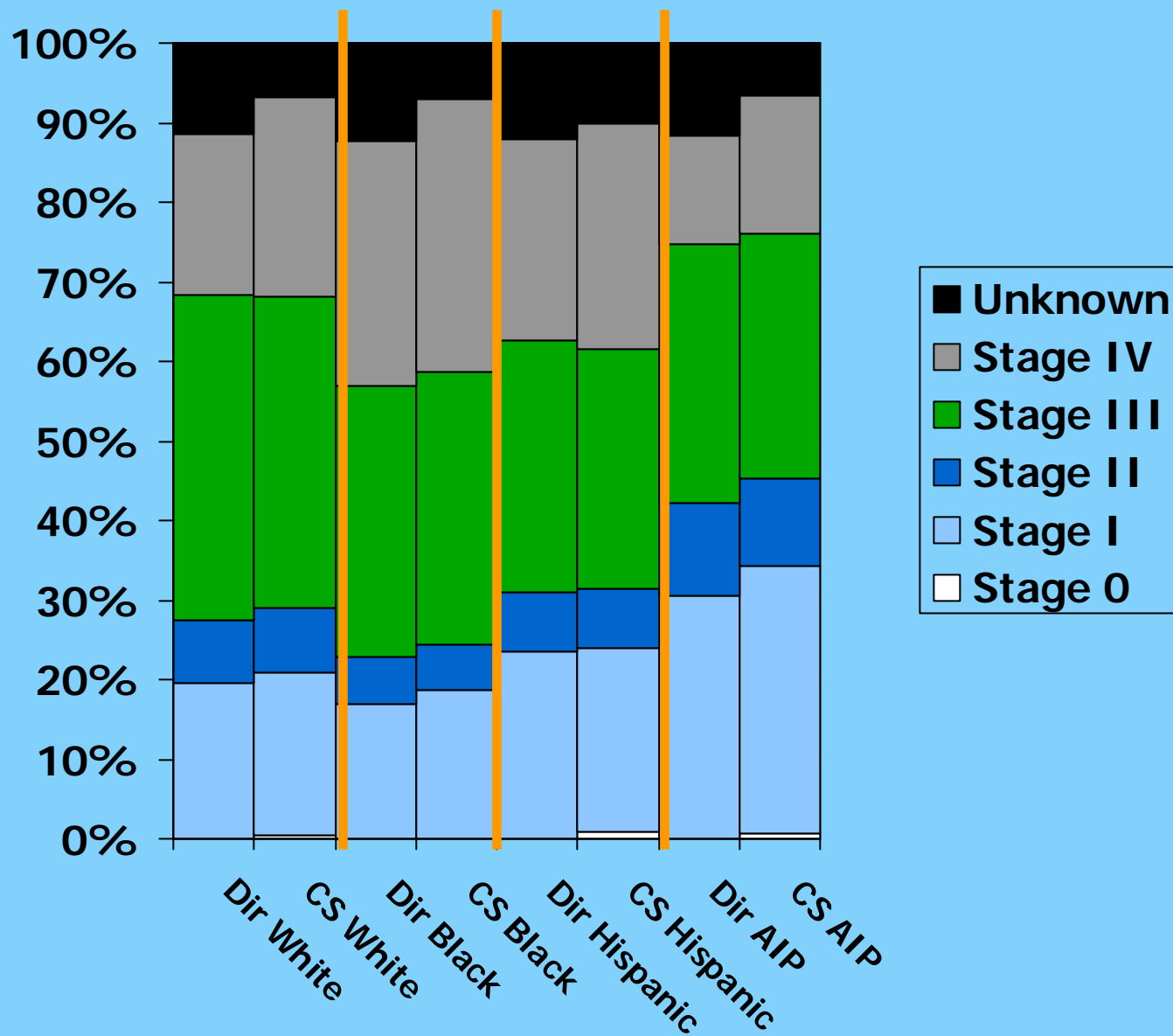
2005: Demographics

Age: Ovary



2005: Demographics

Race/Ethnicity: Ovary



Treatment Choices: Ovary

Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Surgery Only	55	25	19	14
	55	26	19	15
Surgery and Chemotherapy	42	65	70	46
	42	65	70	47
Chemotherapy Only	1	3	5	20
	1	2	6	19
No Treatment	1	3	3	16
	1	3	3	16

Treatment Choices: Ovary

Percents: Direct/**CS Derived**

Treatment / Stage	I	II	III	IV
Surgery Only				
Unilateral (salpingo-)oophorectomy; unknown if hysterectomy	14	5	2	3
	15	6	2	4
Bilateral (salpingo-)oophorectomy, w/ hysterectomy	27	25	11	9
	27	23	11	8
Unilateral or Bilateral (salpingo-) oophorectomy, w/ omentectomy	43	44	34	25
	42	42	36	24
Cytoreductive (debulking), NOS	3	14	45	47
	3	17	43	48

Conclusions

- **In general, switching from Direct Combined AJCC stage to Collaborative Stage Derived Stage had minimal analytic effect on:**
 - Trend
 - Stage distribution by demographic characteristics
 - Treatment choices
- **Where inconsistencies occurred, the reasons were:**
 - Differential use of unknowns
 - Affected by CoC staging rules at the time
 - Registrar-physician comparison best
 - Direct coding of prostate Stage II as I