Towards Cancer Registry Staging of Breast and Cervical Cancer

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Acknowledgements

- *Cancer Staging Project Working Group:* Selphee Tang, Tom Snodgrass, Lee-Anne Weeks, and Cyndy Blanar (Calgary); Carole Russell, Lorette Bowers and Sandi Schafer-Sherman (Edmonton)
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Background

- Under the Cancer Programs Act, the Alberta Cancer Registry (ACR) is responsible for registering all cancers diagnosed in Alberta
- The ACR is housed at the Alberta Cancer Board (ACB), which has a mandate of cancer control for the people of Alberta

Where is Alberta?

- Alberta is a western Canadian province, bordered by the Rocky Mountains on the west and by Montana on the south

Introduction

- Consistent and interpretable cancer staging data is of interest to many groups
- Staging is required for the breast and cervical cancer screening programs
- Prior to this study, the Alberta Cancer Registry (ACR) did not routinely stage cancers

Who did staging?

- Clinicians from the gynecological tumour groups (FIGO)
- Clinicians from the breast tumour group
- *Screen Test: Alberta Program for the Early Detection of Breast Cancer*
- Special breast staging project by ACR

Project Start-up

- The Cancer Staging Project was launched in 2001 November
- The working group was comprised of managers, analysts, and coders
- The project was funded by the Alberta Cancer Board's breast and cervical cancer screening programs

Purpose

- To complete a pilot project that determined staging component requirements and implemented ACR stage data for breast and cervical cancer

Goal

- For the ACR, in collaboration with screening programs, to develop and implement a process to produce cancer staging information for breast and cervical cancers

Objectives

1. To engage the ACR in staging breast and cervical cancers
2. To ensure consistent and interpretable staging is produced by the ACR
3. To create expert staging resources in ACR and ensure sustainability of the project beyond the pilot year

Activities

- Develop database
- Define staging variables
- Obtain charts
- Complete staging
- Complete data entry
- Analyze data
- Develop internal review process
- Consult recognized staging experts
- Write supplementary staging manuals
- Discuss long-term infrastructure required
- Plan for ongoing/ sustainable QA
- Plan long-term database

Deliverables

- Completed staging on 1 year of breast cancers (2000)
- Completed staging on 5 years of cervical cancers (1997-2001)
- Quarterly reports on internal comparison of staging discordance
- Discussions with staging experts
- Supplementary staging manuals
- ACR staffing plan
- Report on QA plan
- Plan for long-term storage of data

Method

- Case Ascertainment:
  - breast cancers diagnosed in 2000
  - invasive and microinvasive cervical cancers diagnosed 1997-2001 and convenience sample of in situ cases
- All cases determined by ACR
- All charts provided from ACB facilities

Method

- Procedure:
  - Core components determined after assessing staging variables collected for TNM and FIGO, ACB ACR, Optx, and Screen Test applications, research projects, and Canadian Breast Cancer Screening National Database
  - Staging forms were developed for scanning individual fields directly into a database, minimizing data entry and errors

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Breast Cancer Staging Report v1.7

Cancer Staging Project - 2001/2002

Coder: ☐☐☐ Date: ☐☐☐☐ / ☐☐ / ☐☐ (yyyy / mm / dd)

Identification

ACB Number: | Malignancy Number: | Morphology Grade:

ULI/PHN: | ICD-0 Site: | Diagnosis Date:

Birthdate: | ICD-0 Morphology: | Date Status:

Site and Cytology

In situ: ☐ no ☐ DCIS ☐ LCIS ☐ DCIS and LCIS Clinical diagnosis only: ☐

Laterality: ☐ right ☐ left ☐ unknown ☐ multiple_forms

Cytology Date: ☐☐☐☐ / ☐☐ / ☐☐ Date Status: ☐

Clinical Invasive Tumour Size

Size: ☐☐.☐ cm ☐ unknown

Tumour pre-treated: ☐ yes ☐ no ☐ unknown ☐ not mentioned

Size Source:
☐ mammogram/ultrasound
☐ surgical
☐ physical exam
☐ unknown

Pathological Invasive Tumour Size

Number of Fragments: ☐☐ ☐ unknown

if more than 2 fragments, Pathologist: ☐☐☐

Fragment 1	Unknown	Fragment 2	Unknown	Fragment 3	Unknown
Width 1: ☐☐.☐ cm	☐	Width 1: ☐☐.☐ cm	☐	Width 1: ☐☐.☐ cm	☐
Width 2: ☐☐.☐ cm		Width 2: ☐☐.☐ cm		Width 2: ☐☐.☐ cm	
Width 3: ☐☐.☐ cm		Width 3: ☐☐.☐ cm		Width 3: ☐☐.☐ cm	

Additional Findings

In situ with invasive:	☐ yes	☐ no	☐ unknown	☐ not mentioned
Multifocal tumour:	☐ yes	☐ no	☐ unknown	☐ not mentioned
Resection margins free of invasive tumour:	☐ yes	☐ no	☐ unknown	☐ not mentioned

Regional Lymph Node Metastasis

Clinical lymph node:	☐ yes	☐ no	☐ unknown	☐ not mentioned
Matted/fixed:	☐ yes	☐ no	☐ unknown	☐ not mentioned
Pathologic lymph node:	☐ yes	☐ no	☐ unknown	☐ not assessed

Number Assessed: ☐☐ Number Positive: ☐☐

Internal mammary positive: ☐ yes ☐ no ☐ unknown ☐ not mentioned

Sentinel node biopsy: ☐ not done ☐ only ☐ with axillary dissection ☐ unknown ☐ not mentioned

Metastatic Sites

Distant metastasis: ☐ yes ☐ no ☐ unknown ☐ not mentioned

☐ adrenal	☐ hepatic	☐ peritoneum	☐ skin	**Pathologic Confirmation**
☐ bone marrow	☐ lymph nodes	☐ pleura	☐ unknown	
☐ brain	☐ osseous	☐ pulmonary	☐ other _____	☐

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TNM Stage

AJCC [X] 5th Edition [ ] 6th Edition

	TNM categories	Clin	Path	Clinician Clin	Clinician Path
Primary Tumour (T)					
Primary tumour cannot be assessed	TX	☐	☐	☐	☐
No evidence of primary tumour	T0	☐	☐	☐	☐
Carcinoma in situ: Intraductal carcinoma, lobular carcinoma in situ, or Paget's disease of the nipple with no tumour	Tis	☐	☐	☐	☐
Tumour 2 cm or less in greatest dimension	T1	☐	☐	☐	☐
Microinvasion 0.1 cm or less in greatest dimension	pT1mic	☐	☐	☐	☐
Tumour more than 0.1 cm but not more than 0.5 cm in greatest dimension	T1a	☐	☐	☐	☐
More than 0.5 cm but not more than 1 cm in greatest dimension	T1b	☐	☐	☐	☐
Tumour more than 1 cm but not more than 2 cm in greatest dimension	T1c	☐	☐	☐	☐
Tumour more than 2 cm but not more than 5 cm in greatest dimension	T2	☐	☐	☐	☐
Tumour more than 5 cm in greatest dimension	T3	☐	☐	☐	☐
Tumour of any size with direct extension to (a) chest wall or (b) skin, only as described below	T4	☐	☐	☐	☐
Extension to chest wall	T4a	☐	☐	☐	☐
Edema (including peau d'orange) or ulceration of the skin of breast or satellite skin nodules confined to same breast	T4b	☐	☐	☐	☐
Both T4a and T4b	T4c	☐	☐	☐	☐
Inflammatory carcinoma	T4d	☐	☐	☐	☐
Paget's disease associated with a tumour is classified according to the size of the tumour					
Regional Lymph Nodes (N)					
Regional lymph nodes cannot be assessed (e.g., previously removed or not removed for pathologic study)	NX	☐	☐	☐	☐
No regional lymph node metastasis	N0	☐	☐	☐	☐
Metastasis to moveable ipsilateral axillary lymph node(s)	N1	☐	☐	☐	☐
Only micrometastasis (none larger than 0.2 cm)	N1a	☐	☐	☐	☐
Metastasis to lymph nodes, any larger than 0.2 cm	N1b	☐	☐	☐	☐
Metastasis in 1 to 3 lymph nodes, any more than 0.2 cm and all less than 2 cm in greatest dimension	N1bi	☐	☐	☐	☐
Metastasis to 4 or more lymph nodes, any more than 0.2 cm and all less than 2 cm in greatest dimension	N1bii	☐	☐	☐	☐
Extension of tumour beyond the capsule of a lymph node metastasis less than 2 cm in greatest dimension	N1biii	☐	☐	☐	☐
Metastasis to a lymph node 2 cm or more in greatest dimension	N1biv	☐	☐	☐	☐
Metastasis to ipsilateral axillary lymph nodes that are fixed to one another or to other structures	N2	☐	☐	☐	☐
Metastasis to ipsilateral internal mammary lymph node(s)	N3	☐	☐	☐	☐
Distant Metastasis (M)					
Presence of distant metastasis cannot be assessed	MX	☐	☐	☐	☐
No distant metastasis	M0	☐	☐	☐	☐
Distant metastasis (includes metastasis to ipsilateral supraclavicular lymph node(s))	M1	☐	☐	☐	☐

Overall Stage

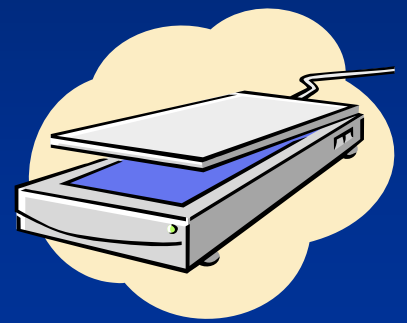
				CR Best	Clini-cian
TX	NX	MX	X	☐	☐
Tis	N0	M0	0	☐	☐
T1	N0	M0	I	☐	☐
			II	☐	☐
T0	N1	M0	IIA	☐	☐
T1	N1	M0			
T2	N0	M0			
T2	N1	M0	IIB	☐	☐
T3	N0	M0			
			III	☐	☐
T0	N2	M0	IIIA	☐	☐
T1	N2	M0			
T2	N2	M0			
T3	N1	M0			
T3	N2	M0			
T4	Any N	M0	IIIB	☐	☐
Any T	N3	M0			
Any T	Any N	M1	IV	☐	☐
Not mentioned					☐

Reports Used for Invasive Cancer

Date of First Appointment: ☐☐☐☐ yyyy ☐☐ mm ☐☐ dd N/R ☐

	Last Date Received	Date Status
O/R Report	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Progress Note	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Tumour Board Rounds	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Discharge Summary	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Pathology Report	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Radiology Report	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐
Other	☐☐☐☐ yyyy ☐☐ mm ☐☐ dd	☐

Comments - Please **print** brief comments in the boxes provided below.



Method

- Procedure continued:
  - 4 part-time coders (Calgary/Edmonton) requested, reviewed, and interpreted patient charts and other relevant documents
  - Coders:
    - used AJCC TNM 5th ed rules
    - filled out the staging form
    - scanned and verified staging forms

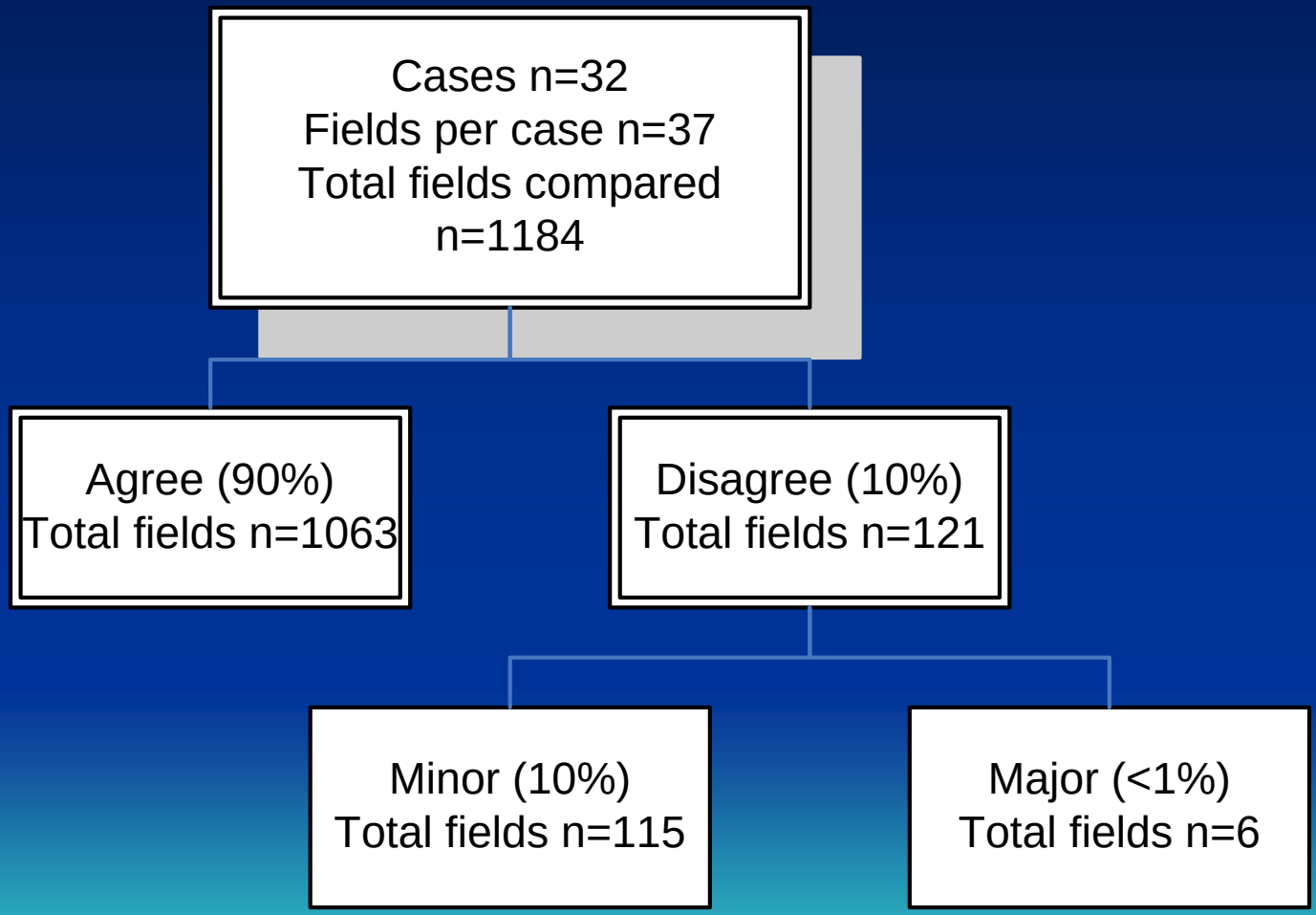
Method

- Quality Assurance (QA):
  - Inter-coder reliability (between)
  - Intra-coder reliability (within)
  - Comparison between clinician and ACR staging
  - Creating supplementary coding manuals
- Analyses:
  - Frequencies, percentages, cross-tabulations and correlations

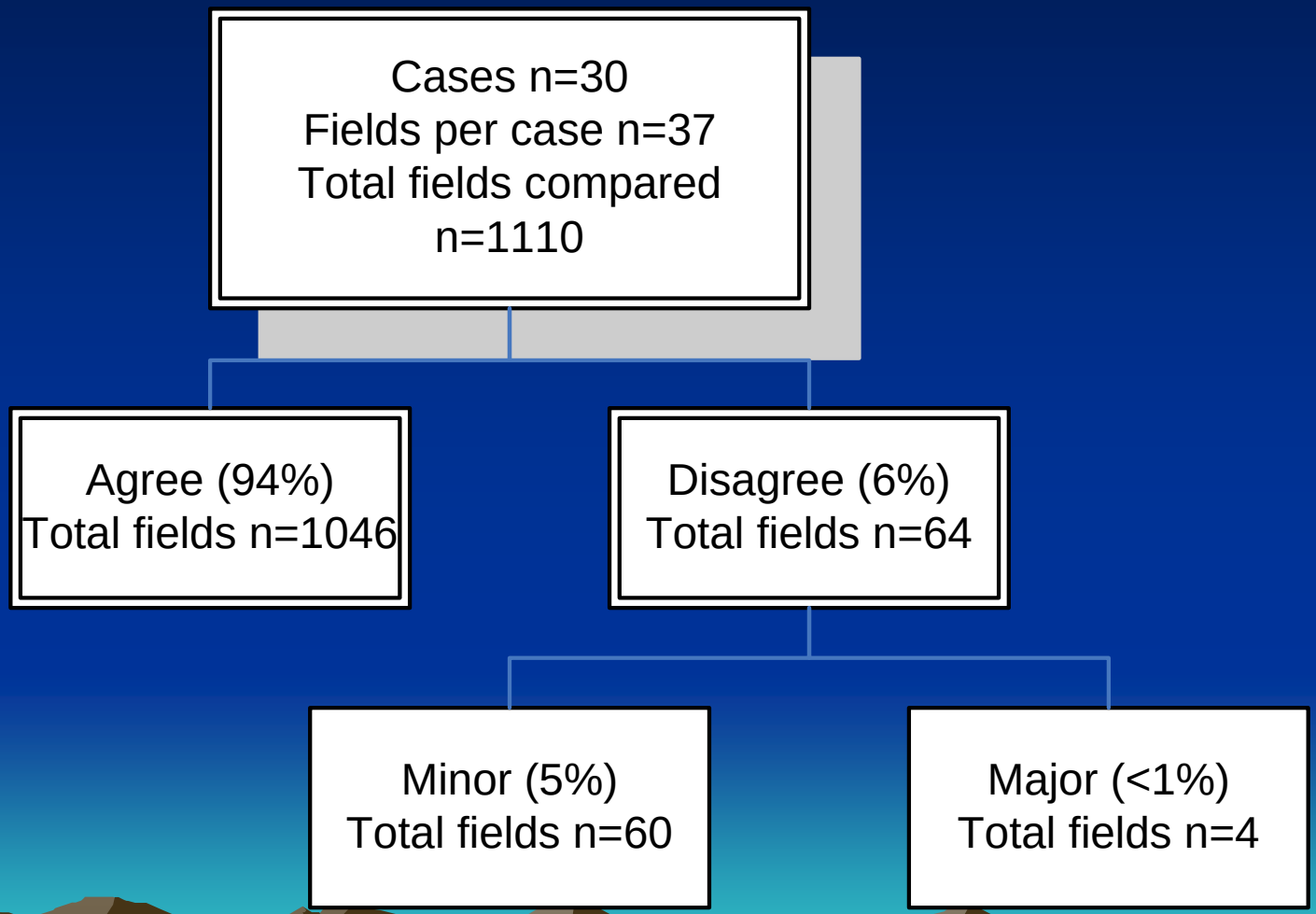
Results - Breast

- Excluded 150 cases, mainly due to non-Alberta residency (12 males excluded)
- 2 simultaneous primary tumours within 1 case counted as 2 separate cases
- Total cases used n=1831
- A subselection of the most-difficult-to-interpret cases were selected for QA
  - e.g. nodal/metastatic involvement, multiple fragments, etc

Results breast inter-coder reliability



Results breast intra-coder reliability



Results – Breast

- Inter-coder and intra-coder discrepancies:
  - Less than 1% of fields were affected by 2 reasons for major discrepancies
  - Charts in northern and southern Alberta differ significantly in format and content
  - Intra-coder testing was done mid-way through project when coders had more experience
  - Coder review provided more opportunities to discuss difficult cases with staging experts

Results - Breast

- Most common topography was upper-outer quadrant c50.4, (35%)
- Most common morphology code was infiltrating duct carcinoma NOS, 85003 (66%)
- Grade not determined 91% in situ and 50% pretreated cases
- 88% of invasive and pretreated cases could be staged 180 days after diagnosis

Results - Breast

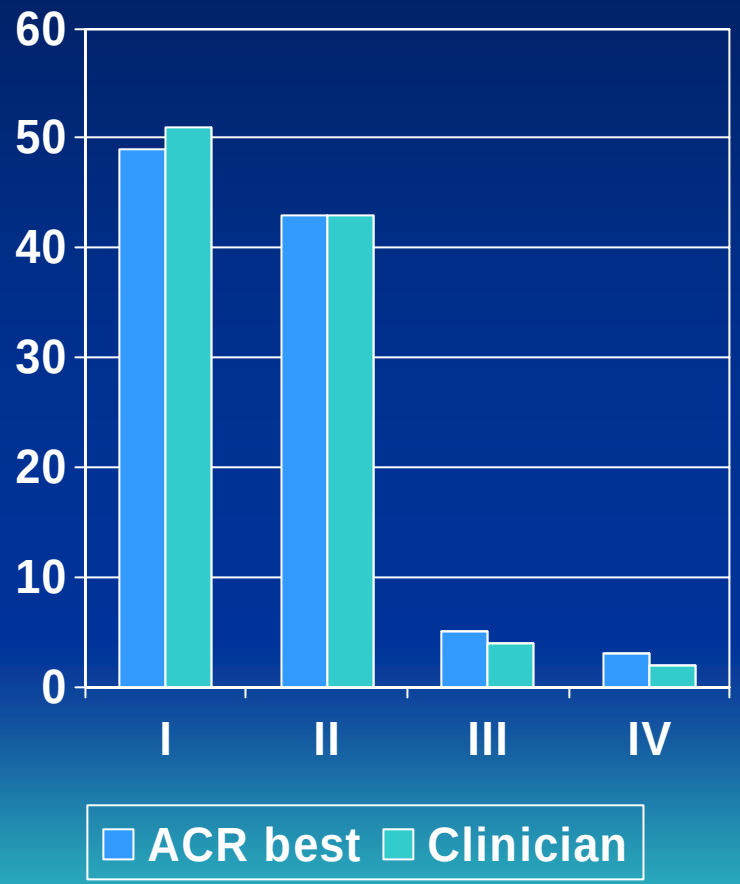
- Breast cancer distribution:
  - 10% in situ
  - 83% invasive
  - 8% pre-treated
- Southern pathologists more likely report multiple fragments (85%) than northern pathologists (15%)

Results - Breast

- ACR was able to stage 92% of cases; clinician stage was found for 74%
- Overall, there were 58% exact matches between ACR and clinicians
- When missing, X and not mentioned cases were removed, the agreement between ACR and clinicians increased to 95% (with collapsed subcategories)

Results - Breast

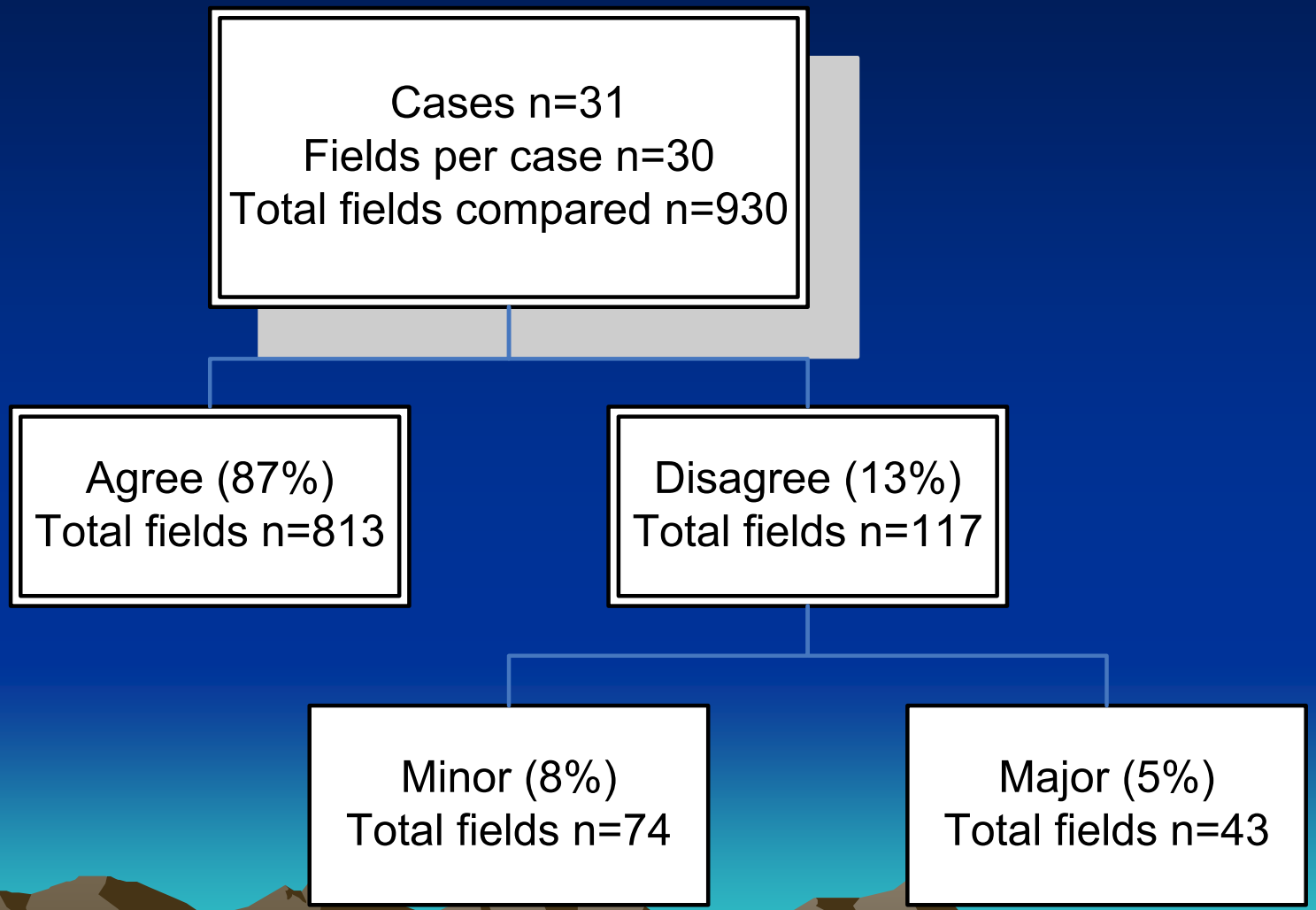
- When not mentioned and undetermined (X) were removed, the proportional distribution of best stage is very similar between ACR and clinicians



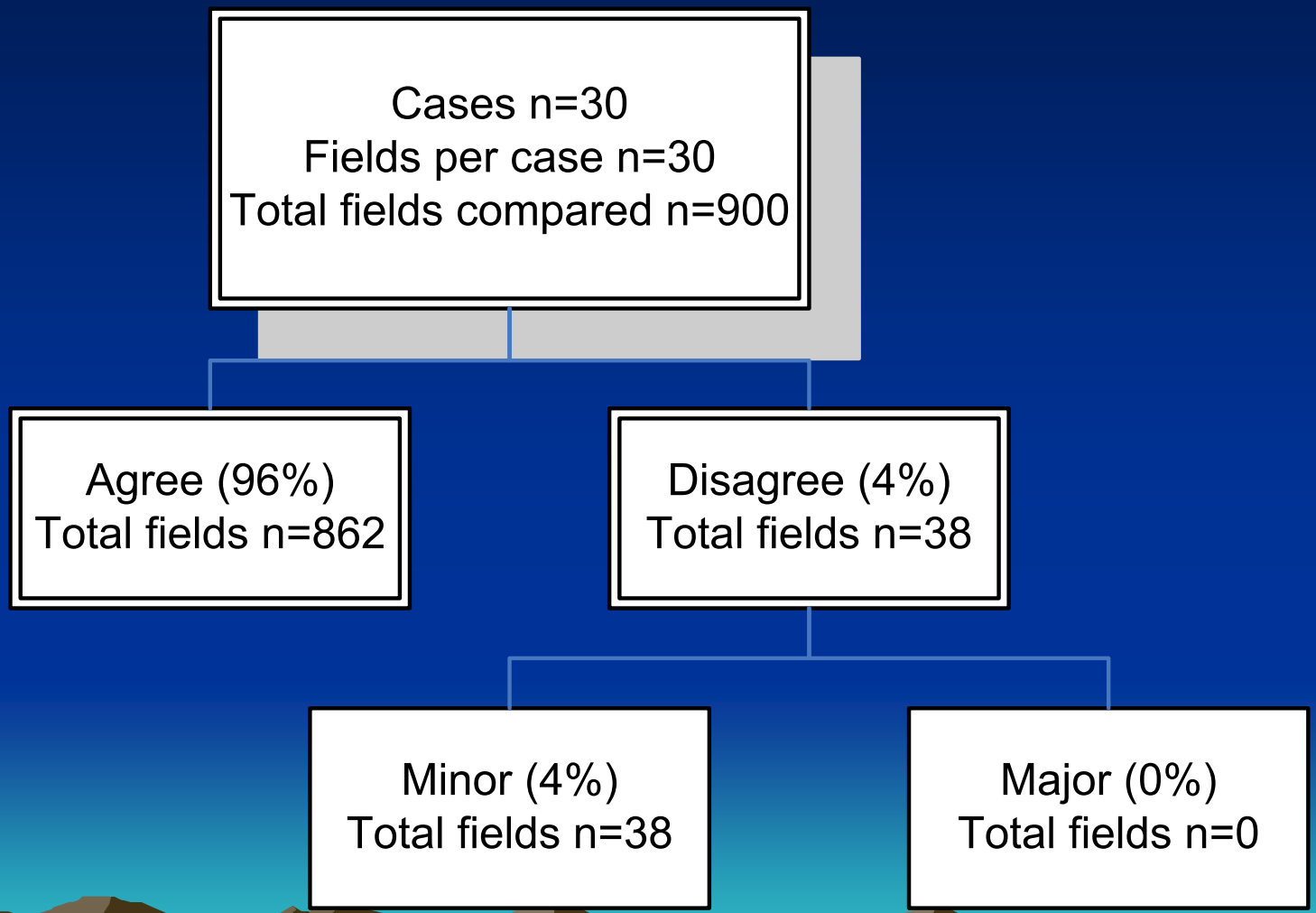
Results - Cervical

- 2409 cases were excluded, mainly in situ cases with little information
- Total cases used n=929
- A subselection of the most-difficult-to-interpret cases were selected for QA
  - e.g. Nodal or metastatic involvement, microinvasion etc

Results cervix inter-coder reliability



Results cervix intra-coder reliability



Results - Cervical

- Inter-coder and intra-coder discrepancies:
  - Only difficult-to-stage cases were used
  - Some definitions not clarified until mid-project
  - Staging form revised between original and second review
  - Only 2 major inter-coder discrepancies were found that affected less than 5% of fields
  - No major intra-coder discrepancies found

Results - Cervical

- Most common ICD-O topography was cervix uteri, c53.9 (83%)
- Most common ICD-O morphology was intraepithelial neoplasia grade III 8077/2 (22%)
- Over half of all cases were missing grade
- 93% of invasive cases could be staged 180 days after diagnosis

Results – Cervical

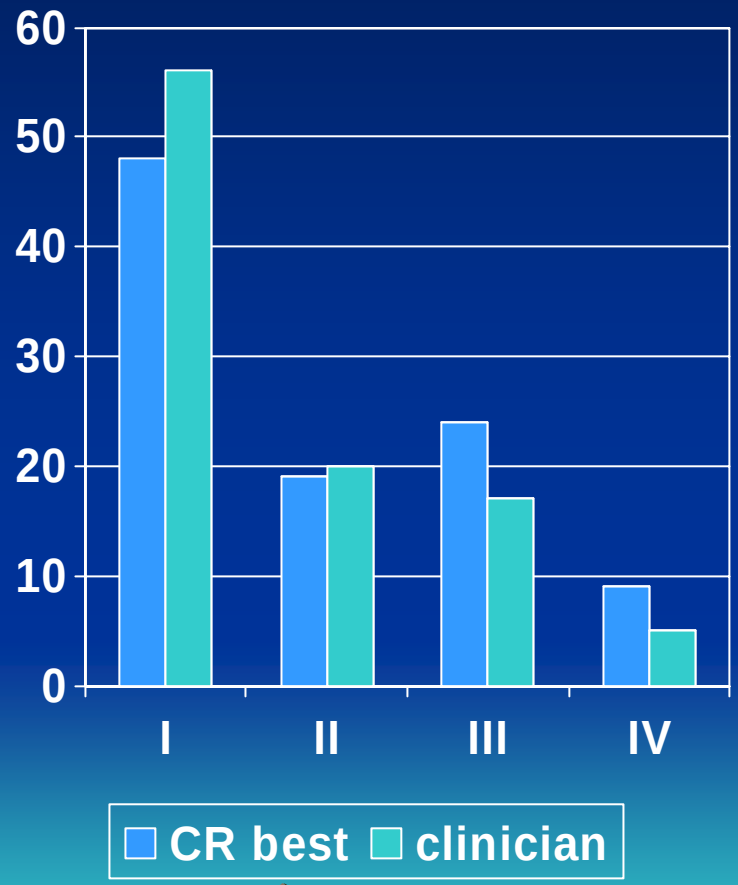
- Cervical cancer distribution:
  - in situ (23%)
  - microinvasive (23%)
  - invasive (54%)
- Little information available for in situ or microinvasive cancers
- Only 25% invasive tumour size available

Results - Cervical

- ACR was able to stage 96% of all Alberta cervical cancers; clinician stage was found for 61%
- Overall, there were 14% exact matches between ACR and clinicians
- When adjustments were made for missing stage, there was 88% agreement (with collapsed subcategories)

Results – Cervical

- When not mentioned and undetermined (X) cases were removed, the proportional distribution of best stage shows that clinician stage is somewhat lower than ACR stage
- Likely due to clinician clinical stage not being changed from I to III when nodal involvement found on surgery



Conclusion

- The cancer staging pilot project was successful in meeting its goal of developing and implementing a process to produce cancer staging information for breast and cervical cancer
- A new, central source for consistent and interpretable cancer staging information was created

Conclusion

- The project took 17 months to complete and the final direct project costs were below estimated costs
- 1 year of eligible breast and 5 years of cervical cancers were staged
- 2 new supplementary coding manuals were produced
- The screening programs received provincial baseline staging information

Recommendations

- The ACR should continue to stage cancers after resources are reviewed
- Collaborative stage requirements should be incorporated as they are developed
- Further collaboration with clinicians and staging experts should encouraged to ensure staging information is consistent and interpretable for use by all groups

Questions?